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THIS lecture honours year by year the memory of a distinguished man† who belonged to the main body of the profession, from which the branches have sprung and from which they draw their nourishment. He was a general practitioner. It is fitting that the Bradshaw lecturer should pay tribute not only to Dr. Bradshaw but also to his successors of to-day. Unshielded by any official or institutional position, and constantly exposed to ill-informed criticism, they are faced by the infinite variety of disease in all its forms. Any man who embarks on such a gallant adventure deserves all the help and support the special branches of medicine can give him, and if he is wise will seek it.

Personally I owe a debt which I can never repay to the many practitioners who at one time or another, and some of them through long periods of years, have given me their confidence and provided me with the material upon which this lecture is based.

A minority of cases of chronic mastitis are relics of a preceding acute mastitis or traumatic hæmatoma, or arise from persistent local pressure by the bones of a corset, or from the pressure of a simple tumour upon the surrounding breast tissue. These facts show the inflammatory associations of the disease. As a rule, however, the disease begins insidiously. It derives importance not only from the mental anxiety it causes to the patient and her medical adviser, from its frequency, from the difficulties which may beset its diagnosis, but above all from its ultimate association with malignant disease. My main object is to discuss its pathogenesis but I must refer briefly to its clinical features.

Clinical Features.

In some cases chronic mastitis affects the whole of both breasts. The breast tissue retracts towards the nipple and the breasts are represented by highly convex discs of rubbery tissue, resembling the end of a lemon, and perhaps only two inches in diameter. If these cases were typical, it would be logical to seek for a purely constitutional cause of the disease, but in the typical case of chronic mastitis only a portion of the breast substance is affected and the other breast may escape. The area of election is the upper and outer quadrant. The indurations are frequently bilateral and not infrequently symmetrical. They are in most cases sector-shaped, bounded that is by two radii of the breast and the intersected portion of its circumference. Several such sector-shaped indurations may be present in the same breast. Since the breast consists of 15 to 20 sector-shaped lobes, laid together like shortbread in a circular box, it is clear that chronic mastitis affects the breast by lobes, affecting some and sparing others. This curious incidence must be determined by a local factor, probably a chance infection of certain ducts where they open, each separately from the rest, upon the surface of the nipple.

The sector shape of the indurations is very important from a diagnostic point of view, for carcinoma by contrast nearly always produces a rounded and defined lump, since the growth infiltrates indiscriminately around its point of origin and does not respect the anatomical boundaries between the lobes.

The sector-shaped indurations of chronic mastitis are uniformly and finely granular, only vaguely to be felt by the flat hand laid upon the breast. They can however be defined with considerable accuracy by the method I have termed the "cat-tread" method of examination. Two fingers make alternate pressure upon the breast while travelling slowly over its surface, after the manner of a cat kneading its bed before lying down. As it slips under the examining fingers the surface and the edge of the induration can be easily felt and distinguished from mere induration of the subcutaneous fat. If the breast is heavy and pendulous the examination should be made with the patient recumbent.

The thickening and tenderness are subject to exacerbations at the time of the menstrual periods when actual aching pain is experienced. A small minority of cases suffer from neuralgia so severe that it may necessitate mastectomy. In some cases the onset of a period relieves the pain and tenderness.

In certain cases the indurated area contains one or many defined rounded lumps, some hard, some elastic or fluctuating. These cases of *cystic chronic mastitis*, first described by Réclus and Schimmelbusch, and occurring usually towards middle age, have been studied especially by Lenthal Cheatle, who has shown that the cysts are distended portions of the duct system. Cystic mastitis appears to be a late development of the non-cystic form. It is a dangerous variety of chronic mastitis, and though it may persist unchanged for many years an ultimate termination in carcinoma is always to be feared.

In chronic mastitis the axillary glands may be slightly enlarged, tender, and elastic. The glands in carcinoma on the other hand are hard and insensitive. In chronic mastitis the breast is free from adhesion either to skin or fascia and the nipple is not retracted.

Chronic mastitis may be subject to subacute exacerbations in which the breast is swollen and heavy while the skin temporarily shows lymphœdema (peau d'orange) and may be slightly adherent to the breast, a fact which indicates the inflammatory nature of the disease. A tender ridge of lymphœdema may sometimes be felt along the lower margin of the breast. Nipple changes are absent in chronic mastitis except in the form which is secondary to catarrh of the main ducts. In duct catarrh, which is a precancerous condition, plugs of epithelial debris mark the orifices of the milk ducts, and from them worm-like casts like those from a sebaceous gland can sometimes be squeezed, while the thickened ducts can be felt as they converge to the nipple. Mastitis may coexist with early Paget's disease of the nipple.

Apart from duct catarrh there are three danger-signals in chronic mastitis which should never be ignored.

Duct-retraction.—The first is indrawing of one or more of the duct orifices upon the nipple. The fibrous capsule of a lobe of the breast is continued along its main duct to the nipple. Hence any fibrotic process in the lobe or its capsule, especially if it occurs around the main duct, exerts traction upon the nipple and tends to retract the duct orifice

* The Bradshaw lecture, delivered before the Royal College of Surgeons of England, Nov. 12th, 1931.

† William Wood Bradshaw, M.A. Oxf., D.C.L., LL.D., F.R.C.S., who for many years practised at Reading.

affected, which comes to lie at the bottom of a little pit or depression upon the surface of the nipple.

Deviation of the nipple.—A second consequence of fibrosis occurring in a lobe of the breast is an alteration in the long axis of the nipple, which tilts towards the indurated lobe. Marked degrees of this tilt are only seen in carcinoma. Slighter degrees, which need very careful observation for their detection, should arouse a suspicion that a precancerous stage of mastitis has been reached.

Serous or blood-stained discharge from the nipple.—The third danger-signal is a serous or blood-stained discharge from the nipple. This usually, but not necessarily, indicates the presence of duct papillomata in the ducts of the mastitic area. Except in the case of athletic young women under 30, in whom it may be produced by violent exercise, grave importance must be attached to the symptom.

Views of Sir Lenthal Cheatle.

The very existence of chronic mastitis is denied by no less an authority than Sir Lenthal Cheatle, whose admirable histological work on the breast has only this year received recognition from the College in the award to him of the Walker Prize for Cancer Research.

He says: "I never use the term 'chronic mastitis,' I say the state is, as may be, either a local or a diffuse hyperplasia of the breast tissues respectively." [1] What he asserts in this sentence does not exclude the truth of what he by implication denies. Hyperplasia is the most constant result of chronic inflammation. He further says, quite truly: "As the lesion is local and not affecting the whole breast the result must be a combined effort of physiological and pathological processes that are operating locally. Hence, much more complicated principles are concerned than merely those of inflammation."

Cheatle has made a masterly and accurate survey of the morbid histology of the breast in chronic mastitis. He has studied, as no one had done before him, the changes in the epithelium which lead to papilloma and to carcinoma. He has minutely described the various hyperplastic changes in the connective tissue and has shown that the appearances of chronic mastitis pass on into those of fibro-adenoma. He appears to infer that since chronic mastitis may produce a neoplasm, it cannot be at any stage an inflammatory process. He has particularly studied the fibrous hyperplasia just outside the basement membrane but inside the elastic layer which Ribbert [2] and Bonney [3] described as precancerous, and which he calls subepithelial hyperplasia. He says: "I have seen this hyperplasia in breasts in which neither malignant nor benign tumours were present, and also in breasts in which benign and malignant tumours were present in the same glands; yet I can observe nothing to contra-indicate the assumption that epithelial activity is the primary change in carcinoma." He says also, "In the early state of hyperplasia subepithelial inflammatory signs are absent," and so contradicts the careful observations of Ribbert and Bonney.

Thus Cheatle refuses to correlate the connective tissue and the epithelial changes, and to recognise that the latter are secondary to the former, that they are related as cause and consequence. Observation shows, as Bonney first demonstrated, that the connective tissue changes precede the epithelial ones which Cheatle erroneously asserts to be primary. Further, beyond a hint that a toxin or ovarian internal secretion may be concerned in producing it, Cheatle leaves breast hyperplasia as an unexplained mystery so far as I have been able to understand his writings.

Cheatle's rejection of the term chronic mastitis results from a too rigid conception of the process of inflammation and can only be accepted by those who are also prepared to deny, with him, the inflammatory nature of chronic tuberculous processes. He does not admit that increased circulation can produce hyperplasia. In order to prevent the contamination of his writings by orthodoxy he always segregates the offending term "chronic mastitis" between inverted commas. I yield to no one in my admiration for his work and have found his writings a storehouse of accurate minute anatomy and a key to the origin of cysts and fibro-adenomata, but he does not supply any light upon the pathogenesis and morbid physiology of the subject of this lecture, beyond his general view that it is a mammary hyperplasia tending to neoplasia.

Cheatle sharply separates chronic mastitis, which he calls "mazoplasia," and declares to have no connexion with cancer, from cystic chronic mastitis which he terms "cystiphorous desquamative epithelial hyperplasia," and regards as a precancerous condition. This separation is a purely arbitrary one, for he himself in examining breasts post mortem found in combination in the same breast mazoplasia, epithelial proliferation, multiple cysts, and signs of early duct cancer. He states that in 20 per cent. of cancers of the breast a cystiphorous condition is present, but appears to leave unexplained the other 80 per cent. of cases. Cases of cystic mastitis occur in which none of the cysts shows epithelial proliferation. Two such cases are recorded in the catalogue of our museum. The cysts in these cases were lined by flattened atrophic epithelium. On the other hand, mazoplasia, that is, non-cystic chronic mastitis, may lead to malignancy, for the breast figured in Fig. 78 (Cheatle and Cutler) cannot be described as cystiferous. It would appear therefore that mastitis and cystic mastitis are essentially the same process in different stages.

Cheatle gives such a wide extension to the term mazoplasia that as he describes it it ceases to be a clinical entity, and cannot be identified completely with chronic mastitis. He states that it is more physiological than pathological, and that it is almost universal in parous women up to the menopause. Pain and nodularity affecting the whole of both breasts characterise it, but clinical signs may be absent. It disappears at the menopause and never gives rise to cysts. If cysts appear in an area of mazoplasia they are due to an independent cystiferous hyperplasia. I admit that I cannot understand why the clinical fact that cysts often appear in an area of chronic mastitis should be thus strangely interpreted.

Cheatle recognises the coexistence of the connective tissue and epithelial changes which together make up the entity of chronic mastitis. He says:—

> "It is rare to find any type of connective tissue hyperplasia without a corresponding hyperplasia of the epithelium in the ducts and acini concerned."

And again:—

> "The processes I describe overlap each other to such an extent that I can show whole sections of breasts that contain in each respectively fibro-adenoma, duct papilloma, carcinoma, hyperplasia intra-elastica, hyperplasia extra-elastica, and cysts, as well as other types of epithelial hyperplasia."

Thus upon evidence derived from Cheatle's own writings his attempt to separate chronic mastitis from its cystic form must be held to fail. In cystic mastitis there is a raised secretory presence within the ducts which leads to their distension. Correlated

with this there is a greater tendency in cystic mastitis to malignant change in the epithelium.

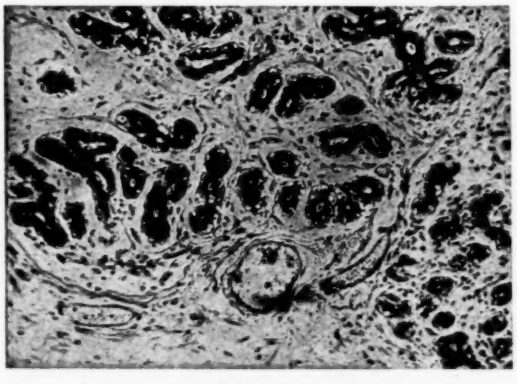
The concurrence of the epithelial and connective tissue changes shows that there is an intimate link between them. Before I attempt to trace this link, and that is the principal object of my lecture, I must clear the ground by considering certain ætiological factors to which varying degrees of importance have been attached.

Ætiology.

Involution.—The theory which maintains that chronic mastitis is merely a morbid variation of the involution which the breast suffers at the menopause can only be applied to cases where chronic mastitis affects the whole of both breasts, and falls to the ground because such cases are very exceptional, and because chronic mastitis is most often seen during the period of active sexual life.

Physiological congestion.—The breast is subject to recurrent high-tides of blood during menstruation, pregnancy, lactation, states of sexual emotion, and prolonged use of the pectoral muscles. In lactation an outlet for the tide of blood is provided in the milk flow. All the other conditions named have an association with chronic mastitis in that they may lead to its onset or aggravation. Mastitic thickenings, unperceived at other times, become tender or painful during the periods. Emotional novels may produce chronic mastitis in young women and excessive golf may have the same result. It is clear that an active circulation is an important ætiological factor. Physiological congestion by itself however cannot be the main cause of a condition which usually affects only a few of the lobes of the breast, leaving others unaffected. Universal chronic mastitis is rare, and only this form could be completely accounted for by general physiological congestion of the breasts.

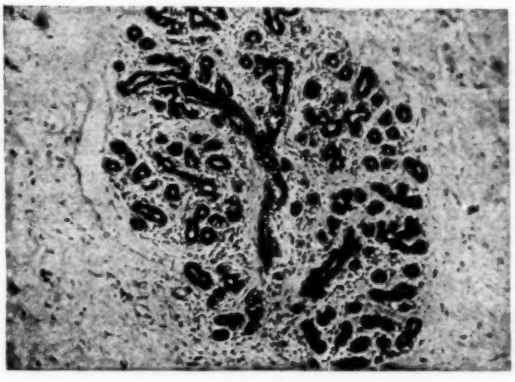
FIG. 1.



Chronic mastitis in the initial stage of lymphatic congestion or lymph stasis which precedes the stage of intralobular fibrosis. The acini are practically normal, though some of them show slight cystic distension. They are surrounded by a system of empty spaces, in places lined by definite endothelium. The system represents the lymphatic vessels and spaces of the lobule distended by lymph. The blood-vessels are also congested. The epithelium shows no change. (×105.) Figs. 1 to 3 are from Handley's "The Genesis of Cancer," Kegan, Paul, 1931.

Duct obstruction.—Mr. C. J. Bond [4] has shown that after indigo has been rubbed into the nipple particles of the dye may be found in the smaller ducts and even on one occasion in the acini. This experiment was made both in the cow and in the human subject. It has been shown that the first milk drawn from a healthy lactating mamma frequently contains organisms, usually staphylococci, and dairymen often reject the first spurts of milk from the cow's udder. The evidence tends to show that the terminal milk ducts cannot normally be regarded as sterile, but that on the other hand bacteria rarely penetrate very far into the recesses of the duct system. Dr. Helen Chambers has proved that the *Demodex folliculorum*, which is certainly a carrier of bacteria, is a very frequent inhabitant of the skin of the nipple, even in persons who practise the daily bath. From these facts it is, I think, fair to conclude that many women of middle age have suffered from mild unnoticed catarrhal infection of one or more of the terminal milk ducts, leading to partial obstruction of the duct, and, what is more important, to fibrosis around it. It is recognised that duct papilloma of the larger ducts frequently produces a mastitic thickening of the lobe draining into the affected duct, and this fact is very helpful in locating the position of a duct papilloma which cannot be felt.

FIG. 2.



Chronic mastitis, stage of early intralobular fibrosis. Another part of the breast from the same case as the preceding figure. Intralobular fibrosis has now begun. A few empty lymph vessels or spaces can still be seen, and the perilobular lymph space is distended by lymph, but most of the distended lymph vessels and spaces have become obliterated and filled up with young fibrous tissue resulting from the proliferative response of the lymphatic endothelium and the fixed connective tissue cells to the stimulus of lymphatic congestion. For the same reason the epithelium of the small duct begins to show proliferative activity. (×85.)

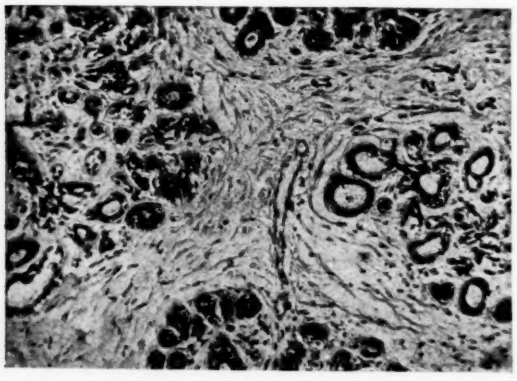
From these facts it may be inferred that duct obstruction and the infection associated with it plays a very important part in the ætiology of chronic mastitis. How does it act? Cheatle and also Keynes [5] have suggested that absorption of chemical irritants derived from shed epithelium in blocked ducts may play an important part in the origin of cancer. Whether this be so or not, it is a fact that large breast ducts blocked by shed epithelium are usually surrounded by adventitious fibrous tissue the result either of bacterial infection or of chemical irritation. These abnormal sheaths must inevitably press upon or obliterate the lymphatics which accompany the duct, and prevent the discharge of lymph from the lymphatic vessels of the lobe into the subareolar plexus. This factor would appear to be of more importance than the obstruction of the duct lumen.

Evidence of Lymphœdema in Early Chronic Mastitis.

When an area of chronic mastitis is examined great variations are found in the appearance of

closely adjacent lobules. It must I think be admitted on general principles of interpretation that these varying appearances represent different stages of the same process. The earliest stage will be seen in

FIG. 3.



Chronic mastitis. More advanced intralobular fibrosis. From the same case as the two preceding figures. The distended lymph spaces and the perilobular lymph sinus have now disappeared, the intralobular fibrous tissue is becoming less cellular and more fibrotic. The acini are dilated, the epithelium is more active and is no longer single layered. Just above A there is a suggestion of incipient malignant infiltration. (×105.)

lobules, if such can be found, which show no hyperplasia, either of the connective tissue or of the epithelium. If other lobules show great connective tissue hyperplasia without epithelial change it will have to be inferred that connective tissue hyperplasia precedes and probably causes epithelial hyperplasia. If on the contrary many lobules show advanced epithelial proliferation without surrounding connective tissue changes, then one must accept Cheatle's view that epithelial hyperplasia is the primary change.

Early stage; lymphœdema.—It is not infrequently possible to find in an area of chronic non-cystic mastitis particular lobules which show no hyperplasia either of the epithelium or of the connective tissue (Figs. 1 and 4). These lobules however are not normal. They show important changes which I think have escaped attention, changes which are a key to the pathogenesis of chronic mastitis. Firstly, the lobule itself is surrounded by a space which appears to be a distended lymph sinus. Secondly, within the lobule each of the normal acini is also surrounded by a similar space, which can often be made out to be lined by endothelium. The appearances clearly demonstrate that the lobule is in a condition of lymphstasis or lymphatic congestion. It would appear that in the breast as in the thyroid gland (G. Scott Williamson) each secreting unit hangs in a kind of lymphatic sinus.

Later stage.—If now by way of contrast we examine a lobule which shows precancerous epithelial change and signs of incipient infiltration, there is no sign of the perilobular lymph sinus; the lobule is closely blended with the surrounding fibrotic tissue. Within the lobule, separating its acini, adult fibrous tissue, poor in nuclei and containing few round cells, is seen. The periacinous lymph spaces have disappeared. The connective tissue has become inactive while the epithelium is excited, many-layered, and may show incipient infiltration. The lobule has been deprived of its lymphatic drainage system by a cicatricial process which leaves no hope of its restoration.

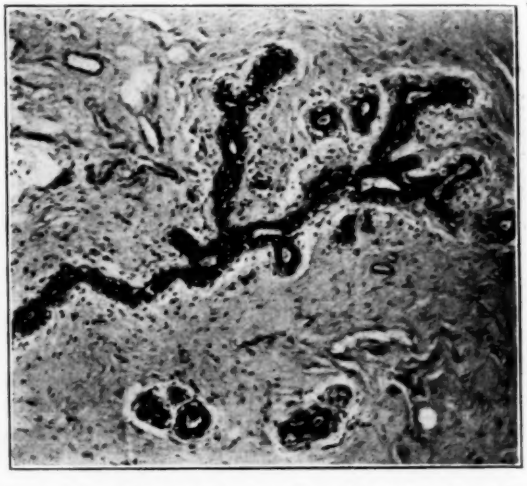
It is to be noted that in this stage the connective tissue changes may not be very striking to the eye, and this is probably the reason why Lenthal Cheatle denies their existence. Old fibrous tissue, poor in nuclei, is easy to ignore, and its tendency to contraction reduces the area which it occupies (Figs. 3 and 6).

Intermediate stage.—Let us now seek for a middle term between the two extremes we have studied: (*a*) lobules showing lymphœdema without other alteration; (*b*) lobules showing proliferation of the epithelium, fibrosis of the connective tissue, and disappearance of the lymph channels. It is not difficult to find in the same microscopic section lobules which show advanced connective tissue changes without much epithelial change, and we will study such a lobule (Figs. 2 and 5).

Some distended lymphatic spaces can still be seen in it and the perilobular lymph sinus persists, but the spaces between the individual acini are now occupied by young richly nucleated fibrous tissue, infiltrated with round cells. The epithelium of the acini remains normal, that of the ducts is beginning to show signs of active proliferation. Connective tissue hyperplasia clearly precedes epithelial hyperplasia, for lobules showing normal connective tissue with proliferated epithelium cannot be found.

To sum up, in an area of chronic mastitis those lobules which show practically normal acini with no evidence of abnormal epithelial activity are in a state of lymphatic congestion with distension of the lymph vessels and spaces. On the other hand, those lobules which show precancerous epithelial change

FIG. 4.



Figs. 4, 5, and 6 from another case of mastitis illustrate various stages of the disease. Fig. 4 shows lymphœdema around a longitudinally cut duct, and the acini opening out of it, each of which is surrounded by a clear space evidently due to distension of the lymph channels. (×72.)

show in addition the working of a fibrotic process which has much increased the total intralobular fibrous tissue and has obliterated the intralobular lymph vessels and spaces and destroyed the perilobular lymph sinus.

Still more briefly it may be stated that in early chronic mastitis there is lymphatic stasis, in late chronic mastitis lymphatic obliteration with the formation of new fibrous tissue. As Victor Bonney has

shown, the new fibrous tissue differs from the normal fibrous tissue in not containing elastic fibres.

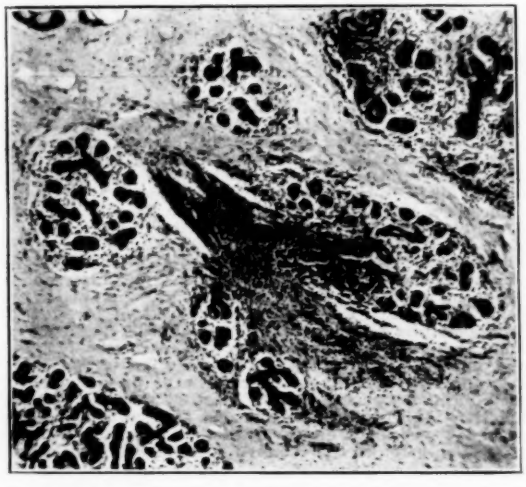
Cause and Effects of Lymphœdema.

Two questions now present themselves. What is the cause of the lymph stasis of early chronic mastitis, and what connexion has it with the intralobular fibrosis and the epithelial changes of the later stage?

In regard to the first question, lymphatic congestion is physiologically recurrent in the breast at the periods, during lactation, and probably during the long-continued active use of the pectoral muscles. What has to be accounted for is the persistence of the condition in certain lobes of the breast in chronic mastitis. An easy explanation is afforded by the casual duct infection of the large ducts near the nipple which, as we have seen, is so frequent, and which is probably lymphatic. These infections produce a periductal fibrosis often visible even to the naked eye, which is probably of lymphangitic origin. Whatever its origin, it must press upon the lymphatics of the affected lobe just before they empty into the subareolar plexus. A lymph block of the affected lobe is thus produced and the recurrent menstrual lymphatic congestion which affects the whole breast becomes permanent and pathological in the lobes thus deprived of their main lymphatic outlet.

What are the effects of lymph block upon the affected lobe? This question is best approached by leaving chronic mastitis for a moment and considering

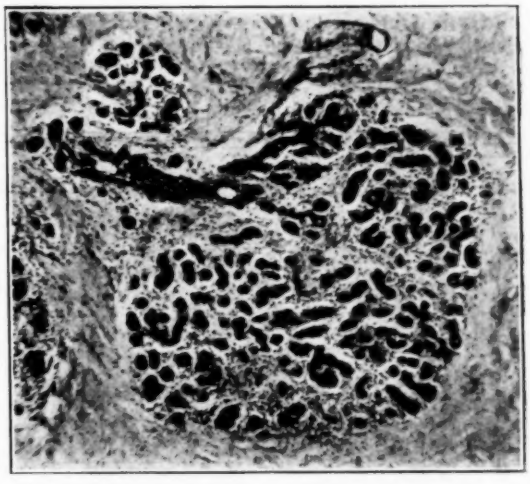
FIG. 5.



Two lobules to the left show lymphœdema with incipient endothelial proliferation. The large lobule in the middle shows definite proliferation of its connective tissue, with abundant round-celled infiltration. Above and to the right is a lobule in which connective tissue proliferation is more advanced. There is no epithelial proliferation. (× 56.)

a disease where there is general agreement as to the presence of lymphatic obstruction—namely, elephantiasis. In this disease lymph stasis is seen clinically to be a powerful agent for provoking the proliferation of endothelium and connective tissue cells, and for the production of fibrous tissue. Microscopical study shows that if the current in a lymphatic vessel becomes stagnant the endothelium proliferates and ultimately blocks the lumen. To this process I have given the name "static" lymphangitis. At the same time the connective tissue spaces become filled with lymph, round cells collect around the blocked lymphatic, and the fixed connective cells in the neighbourhood actively proliferate. A mass of fibrous tissue is ultimately formed. Later the skin epithelium receives

FIG. 6.



From the same case as Fig. 5. Advanced endothelial proliferation within the lobule and obliteration of the perilobular lymph sinus. Though there is no change in the epithelium of the acini, that of the small duct seen above and to the left is beginning to proliferate, and has filled up the lumen of the duct. (× 56.)

an impulse to proliferate, and the skin becomes thickened, and finally papillomatous.

It will be seen at once that this sequence of changes is the same as that we have traced in chronic mastitis. The lymph block of early chronic mastitis produces a "static" lymphangitis which obliterates the lymphatics and stimulates to proliferation not only the intralobular, but the interlobular fibrous tissue. Later, just as in elephantiasis, the epithelium is stimulated and precancerous papillomatous changes manifest themselves in the acini and ducts.

Every stage of the process can sometimes be seen in one microscopic section and these gradations are an important element in the evidence. If it be granted that lymph block is present in the earlier stages of chronic mastitis, and the evidence I have produced is convincing, then the later fibrotic and epithelial changes in the breast which actually occur are those which might be predicted from the observed effects of lymph stasis in other diseases.

The view that chronic mastitis is due to a lymph block of particular lobes of the breast, resulting from the compression or obliteration of their main lymphatic vessels near the nipple, is a clear and intelligible one founded upon definite evidence.

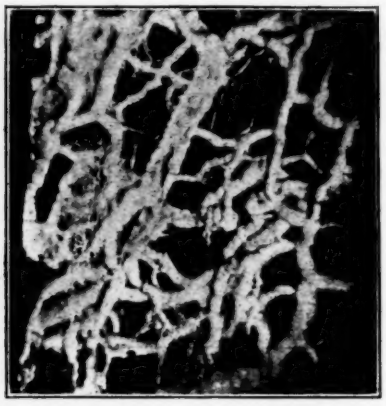
If the effect of obstruction of a lymphatic vessel in causing proliferation of the lymphatic endothelium and finally blocking the lymphatic—the process I have called static lymphangitis—can be correctly described as inflammatory, and few will deny it, then chronic mastitis is an inflammatory condition. In it are seen the ordinary phenomena of chronic inflammation—round-celled infiltration, succeeded by immature spindle-celled tissue, and finally by fibrous tissue. To these changes in the connective tissue the epithelial changes are secondary.

In the splendidly illustrated work on Tumours of the

Breast [6] just published by Cheatle and Max Cutler, which will be indispensable to all students of breast pathology, the authors state: "The condition to which the term 'chronic mastitis' is applied is much more a physiological process than a pathological one, and a process of inflammation least of all. Therefore we adopt the term mazoplasia in the description of the condition."

It is no doubt true, as Cheatle and Cutler state, that there is a menstrual cycle in the histology of the breast,

FIG. 7.



Injected human subarachnoid lymphatic plexus (Hyrtl). From a specimen preserved in the museum of University College, to which my attention was directed by Dr. H. A. Harris.

and that in the premenstrual period the epithelium proliferates, while in the post-menstrual period the epithelium undergoes regressive changes and the connective tissue of the lobule increases in amount. These changes no doubt reflect variations in the flow of tissue fluid through the breast and resemble those of chronic mastitis. But these cyclical changes must not be confused with the irreversible changes produced by lymph block in particular lobes of the breast.

I submit that the vague conception of a physiological hyperplasia tending to neoplasia which is all that the authors offer as an explanation of chronic mastitis is merely a neological and almost mystical restatement of the problem. They have failed to account for the hyperplasia which they have studied so accurately and described so well.

On the contrary, if you accept my view that chronic mastitis is due to a lymph block of particular lobes of the breast determined by casual nipple infections which lead to obstruction of the main efferent lymphatics of the affected lobes, all the phenomena of the disease follow in natural and orderly sequence. I have demonstrated the œdema of early chronic mastitis. Lymph block wherever it occurs is followed after a period of years by fibrous hyperplasia, at a later period by the production of papillomata upon the overlying epithelial surface, and ultimately sometimes by carcinoma. I may venture to ask those who wish to pursue this subject to read my book on the Genesis of Cancer.[7]

The Lymphatic System in Pathology.

It so happens that most of the lectures I have given in this theatre have dealt with the lymphatic system, and I am prepared for the accusation that I am suffering from an obsession. I comfort myself with the knowledge that even so great a man as Pasteur had to suffer a similar accusation when he was "obsessed" by the rôle of bacteria in disease. It is probable that the influence of the lymphatic system in pathology is just as far-reaching as that of bacteria.

I am asking for a thorough revision of the accepted pathology of the day to bring it into harmony with facts about lymphatic anatomy, physiology, and pathology, some of them long known but many of them hitherto ignored. I realise that such a thorough-going revision cannot lightly be granted by professional opinion, but I am confident that it must come.

It is most needed perhaps in dermatology and in neurology. To illustrate this assertion I show in conclusion a specimen which, though foreign to the subject of my lecture, is very relevant to its underlying purpose. It is an injected specimen of the subarachnoid lymphatic plexus (Fig. 7) prepared by Hyrtl many years ago. It has been lying since in the museum of University College waiting for some neurologist to recognise it as a searchlight on neuropathology. Meantime the text-books of anatomy still deny that the central nervous system possesses any lymphatic vessels.

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CENTRAL COUNCIL FOR HEALTH EDUCATION.—This council, which held a conference on Nov. 19th, in the London School of Hygiene, has been in existence for four years and aims at providing a liaison between public authorities on the one hand and voluntary propagandist associations on the other. The president of this year's conference, Mr. Arthur Greenwood, late Minister of Health, spoke reminiscently of the changed ideas in health teaching since his boyhood. To-day, he said, a sense of publicity was necessary in all public teaching, and the expert had something to learn from the advertiser. Mr. J. C. Stobart, education director of the British Broadcasting Corporation, dealt chiefly with the remarkable services of broadcasting to the hospitals by reason of their appeals and with the influence of simple talks over the wireless to school-children and mothers. He emphasised the caution of the B.B.C. in using this remarkable instrument of propaganda. At the afternoon session Mr. G. S. Elliston, M.P., described the functions of the popular magazine entitled *Better Health*, which is the Council's direct contribution to popular teaching. Later a director of the Western Electric Company showed a Viennese film on the Study of Child Growth, and described the ways in which sound health films should be produced.

NEW COTTAGE HOSPITAL AT DRIFFIELD.—Lord Deramore, Lord Lieutenant of the East Riding, recently opened a new cottage hospital at Driffield given by Mr. Alfred W. Bean, of that town, whose name it will bear. The two-acre site was presented by Mr. Horace Taylor, also a local resident. The building has cost £8,350, and the £6000 which had already been raised has been invested for endowment. The simple building, which is of white concrete, was stated at the recent International Architects' Convention in Vienna to be "not only a model modern hospital but a masterpiece for the size," and is said to be the cheapest hospital that has so far been built in this country. The principal wards are described as being "on the lines of a greenhouse, without a glass roof," and patients can be wheeled in their beds on to a terrace which has a sundial engraved on the floor. There are six beds for men, six for women, and four private wards. The architects were Messrs. Elcock and Sutcliffe, of London. The old hospital of eight beds, which has served since 1867, is for sale.

RADIUM AND PAIN.

AN INVESTIGATION OF CERTAIN RESULTS OF RADIOTHERAPY IN CASES TREATED AT UNIVERSITY COLLEGE HOSPITAL.

BY R. S. PILCHER, M.S., M.R.C.P. LOND., F.R.C.S. ENG.,

RADIUM REGISTRAR TO THE HOSPITAL AND ASSISTANT IN THE SURGICAL UNIT.

IN most recent publications on radiotherapy attention has been focused on good results, and little has been heard of ill-effects beyond vague warnings. In a form of therapy that is still largely experimental observations of failure are as important as observations of success. Moreover, the former are often established in a very short time, the latter not for many years.

In reply to an inquiry about one of our patients I recently received a letter from a doctor which expresses a view I have heard more than once. He says ". . . my partner and I have had under our care four cases of inoperable carcinoma treated with radium . . . in our opinion, comparing these cases with others of a similar nature that have not had radium, there has been a definitely greater degree of pain in the later stages and no appreciable prolongation of life." Prompted by this observation I have examined a series of cases treated by radium in which pain has been a prominent symptom, in order to see if any relation can be established between the symptoms and the treatment.

The significance of pain may easily be overlooked by the ardent radium therapist whose interest is centred on the lesion he is treating rather than on the patient. Yet in the choice between radium and surgery in the treatment of disease, in which neither can show a real superiority as judged by survival, the occurrence of painful sequelæ after radium might turn the scale in favour of surgery. The regression of a tumour under the influence of radium, important as it is as a scientific observation, does not necessarily imply a therapeutic success. If the patient's only symptom is pain and that is not relieved, his condition is but little improved. Again, if regression of a tumour is achieved at the price of pain from which the patient was previously free, the exchange is a poor one. On the other hand, one must beware of attributing to radium pain that is due to disease, and when the latter persists in spite of treatment it becomes very difficult to apportion the blame.

For the purpose of this inquiry a survey has been made of all cases treated at this hospital with radium for benign and malignant conditions from April, 1929, to September, 1930, inclusive. During this period 330 cases were treated, of which 250 were cases of malignant disease. From this series have been collected all the cases in which pain was, or still is, a prominent symptom.

Pain is a difficult symptom to assess, depending as it does on the susceptibility of the individual. Only those cases are included in which pain was persistent and of such severity that the patient sought relief. No account has been taken of the sensation of soreness associated with an ulcer—a symptom which disappears as the ulcer heals. Patients with malignant ulcers in the mouth have only been included if suffering from deep-seated or referred pain. Again no account is taken of transient sequelæ of treatment, such as peeling of the skin and proctitis.

The cases are divided into three groups: (1) patients who had pain before, not relieved by treatment; (2) patients who had pain before, relieved by treatment; (3) patients who had pain after but not before treatment—i.e., persistent pain beyond that incidental to treatment.

In Group 1 the treatment is a failure from the patient's point of view. It is important to ascertain if possible: (*a*) whether any of these cases are "cured" in the sense that the lesion treated has resolved; (*b*) whether there is any evidence that pain was aggravated by treatment.

In Group 2 the treatment has been of definite value whatever the prospect of "cure."

In Group 3 it is necessary to differentiate the effects of the disease from those of the treatment, and to ascertain if possible whether in any cases radium can be blamed for the pain.

In all three groups a search has been made for common factors associated with the results described. The factors that may determine the result of radiotherapy are so numerous and complex that little help can be expected from the small series of cases here recorded Moreover, there has been no uniformity of technique, and certain factors such as screenage and linear intensity may be variable in a single case, making it almost impossible to assess their importance.

The first fact that emerges is that in none of the cases of non-malignant disease was pain a prominent feature, either before or after treatment. These cases are mostly gynæcological conditions and benign skin lesions; the former are treated by cavitary irradiation, the latter by surface or interstitial irradiation. The absence of painful sequelæ in 80 cases is not of much moment, since in the skin cases very small doses were employed, and in the gynæcological cases the radium was inserted into one of the most radio-resistant structures in the body—namely, the uterus. These points are stressed lest the results be taken as evidence against the possibility of radium per se producing pain.

Forty-three Cases of Pain Before Treatment.

Site.	Cases.	Died.	Relieved.	Not relieved.
Mouth and pharynx*	17	4	5	8
Nose and naso-pharynx	4	—	—	4
Breast	7	1	3	3
Uterus	9	2	2	5
Skin	2	—	2	—
Bladder	1	—	—	1
Prostate	1	1	—	—
Lymph glands	1	1	—	—
Bone	1	1	—	—

* Includes cases of glandular metastases after operation or irradiation.

Sixteen Cases of Pain After Treatment.

Mouth	8	Ear	1
Breast	2	Anus	1
Uterus	3	Skin	1

Of the 250 cases of malignant disease, 43 patients complained of pain before treatment, a low figure in view of the advanced stage of disease in the majority. Of these 43 cases, 10 died during or shortly after treatment, 12 were relieved of their pain after treatment, 21 were not relieved. Sixteen patients, having been free beforehand, experienced pain after treatment. This group should probably be larger, as little is known of some cases that proceeded to a fatal termination after failure of treatment, but I am

chiefly concerned with the patients in whom life was prolonged. The distribution in the groups defined above is: (1) 21 cases; (2) 12 cases; (3) 16 cases. The distribution according to situation of the growth is shown in the Table given above.

It will be seen that, among 59 cases of pain, in 25 the primary growth was in the mouth. The total number of such cases in the series was 57.

Summary of Cases.

Abbreviations: S.R., surface irradiation; I.R., interstitial irradiation; C.R., cavitary irradiation.

Dosage is recorded thus: 10 × 1·0 mg. 4/15 0·5 P. = 10 needles of 1·0 mg. radium el. each, active length 4 mm., overall length 15 mm. Screen 0·5 mm. platinum.

GROUP I.—PAIN PRESENT BEFORE TREATMENT: NOT RELIEVED.

CASE 1 (1067).—Male, 52. Carcinoma of pharynx; post-operative glandular metastases. Neuralgic pain in neck and head.

Treatment.—August 10th to 15th, 1929: S.R., Columbia paste. 122 mg. in 5 needles. Screen 0·5 P. + 2 mm. Pb. August 19th to 24th: treatment repeated with needles redistributed. Total dose 25,568 mg. hrs.

Result.—Temporary regression of glands followed by more widespread recurrence. Pain not relieved.

CASE 2 (1104).—Male, 56. Extensive carcinoma involving palate, tonsil, and cheek. Referred pain side of head.

Treatment.—Sept. 29th, 1929: S.R. dental bridge, 11 × 0·6 mg. 6/16 0·5 P. 10 days = 1584 mg. hrs. Jan. 1st, 1930: I.R. of ulcer, 9 × 0·6 mg. 6/16 0·5 P. + 2 × 1·0 mg. 13·5/24·5 0·8 P. + 1 × 0·6 mg. 6/16 0·5 P. 7 days. June 2nd: I.R. of ulcer in mouth. 7 × 2·0 mg. 22/32 0·5 P. I.R. of external tumour, 8 × 2·0 mg. 2/32 0·5 P. + 12 × 3·0 mg. 45/60 0·6 P. 7 days = 11,100 mg. hrs.

Result.—Failure to arrest growth. First treatment produced superficial healing, but growth was extending deeply. Pain was not relieved and became very severe terminally.

CASE 3 (1145).—Male, 53. Carcinoma of posterior third of tongue with glandular metastases. Biopsy, Dec. 6th, 1929.

Treatment.—Dec. 23rd: gland dissection. Dec. 31st: I.R. tongue, 10 × 1·0 mg. 13·5/24·5 0·8 P. 2256 mg. hrs. March 14th, 1930: I.R. tongue, 10 × 1·0 Mc. seeds. I.R. neck, 9 × 3·0 Mc. 20/30 0·5 Au. + 20 × 1·5 mg. 10/20 0·5 P. 160 hrs. May 1st: I.R. tongue, 8 × 1·5 10/20 0·5 P. 7 days.

Result.—Ulceration healed, growth apparently arrested, dense induration in tongue and neck. Pain aggravated by treatment, now continuous.

CASE 4 (1247).—Female, 38. Sarcoma of mandible. Pain in jaw and referred to ear.

Treatment.—May 9th, 1930: I.R., 11 × 1·5 mg. 10/20 0·5 P. 7 days, followed by deep X ray therapy.

Growth of tumour not arrested; pain not relieved. Death three months later.

CASE 5 (1268).—Female, 61. Inoperable carcinoma of tongue: pain in tongue and referred to ear.

Treatment of tongue and submaxillary region. June 23rd, 1930: I.R. of tongue and submaxillary region, 4 × 3·0 mg. 45/60 0·6 P. + 5 × 2·0 mg. 22/32 0·5 P. + 12 × 1·0 mg. 13·5/24·5 0·8 P. + 2 × 1·0 mg. 12·5/25 0·5 P. + 4 × 1·0 mg. 4/15 0·5 P. + 5 × 0·6 mg. 6/16 0·5 P. 7 days, approximately 7000 mg. hrs.

Result.—Growth not arrested, pain aggravated. Death four months later.

CASE 6 (1273).—Male, 67. Carcinoma of gum; extensive involvement of mandible, pain locally and referred to ear.

Treatment.—June 19th, 1930: I.R., 9 × 3·0 mg. 45/60 0·6 P. + 15 × 2·0 mg. 22/32 0·5 P. 7 days = 9500 mg. hrs.

Result.—Partial regression of tumour, pain less severe.

Sept. 10th: I.R., 8 × 3·0 mg. 45/60 0·6 P. + 4 × 1·5 mg. 10/20 0·5 P. 7 days = 5000 mg. hrs.

Result.—Slight improvement followed by relapse, pain became much more severe. Death four months after first treatment.

CASE 7 (1275).—Male, 70. Inoperable carcinoma of upper lip, local pain. Patient had diabetes.

Treatment.—June 21st, 1930: I.R. lip and submaxillary region, 11 × 1·0 mg. 13·5/24·5 0·8 P. + 7 × 3·0 mg. 45/60 0·6 P. 10 days = 7600 mg. hrs.

Result.—Slight improvement followed by relapse. Pain became more severe and spread to cheek and frontal region.

CASE 8 (1294).—Male, 53. Carcinoma of tonsil, large fixed mass of glands. Pain in neck and ear.

Treatment.—July 17th, 1930: I.R. of tonsil, 5 × 2·0 mg. 22/32 0·5 P. 7 days = 1680 mg. hrs. I.R. of glands, 12 × 3·0 mg. 45/60 0·6 P. + 5 × 2·0 mg. 22/32 0·5 P. 7 days = 7730 mg. hrs. Oct. 8th: tonsil healed; glands smaller, pain persists. I.R. of neck, 5 × 3·0 mg. 45/60 0·6 P. + 10 × 2·0 mg. 22/32 0·5 P. 10 days = 8400 mg. hrs.

Result.—Growth apparently arrested. Radium ulcer over mastoid process. Pain continues. This patient had large doses, but had a very large mass of glands.

CASE 9 (1045).—Female, 52. Carcinoma of nostril. Pain in forehead and left ear.

Treatment.—July 18th, 1929: I.R., 10 × 0·6 mg. 6/16 1400 mg. hrs. Oct. 21st: C.R. of nostril, 6 × 0·6 mg. 864 mg. hrs.

Result.—Apparent cure of carcinoma, pain less severe, but not completely relieved.

CASE 10 (1132).—Female, 53. Carcinoma of maxillary antrum. Pain in jaw and temple.

Treatment.—Nov. 27th, 1929: I.R., 2 × 1·0 mg. 13·5/24·5 0·8 P. + 1 × 0·6 mg. 6/16 0·5 P. C.R. of antrum, 11 × 0·6 mg. 6/16 0·5 P. 10 days = 2200 mg. hrs. Has since had deep X ray therapy.

Result.—Growth apparently arrested. Pain persists.

CASE 11 (1222).—Male, 28. Endothelioma of nasopharynx and glandular metastases. Pain in forehead and ear.

Treatment.—March 28th and April 2nd, 1930: deep X ray therapy to glands. April 11th: I.R. of primary, 8 × 1·0 mg. 12·5/25 0·5 P. 10 days. May 26th: I.R. of neck, both sides, 20 × 1·5 mg. 10/20 0·5 P. + 16 × 1·0 mg. 4/15 0·5 P. 6500 mg. hrs.

Result.—Regression of primary growth and metastases. Pain more severe than before treatment; first and second divisions of trigeminal.

CASE 12 (1249).—Female, 42. Carcinoma of ethmoid region, bilateral glandular metastases. Pain in ear, side of head and neck.

Treatment.—May 14th, 1930: I.R. of primary, 7 × 0·5 mg. 1·5/10 0·5 P. 288 mg. hrs. June 12th to 25th: X ray therapy to glands. Oct. 29th: excision of primary and prophylactic I.R., 5 × 2·0 mg. 22/32 0·5 P. 10 days. Nov. 27th: X ray to glands.

Result.—Great improvement, but pain only partly relieved.

CASE 13 (1026).—Female, 72. Carcinoma of breast; inoperable. Pain in shoulder and arm.

Treatment.—June 17th, 1929: I.R., 30 × 1 mg. 13·5/24·5 0·8 P. + 10 × 0·6 mg. 6/16 0·5 P. + 5 × 4·4 mg. 5/10 0·3 P. 9750 mg. hrs.

Result.—Failure, death three months later, generalised metastases. Pain not relieved.

CASE 14 (1094).—Female, 61. Post-operative recurrence of carcinoma of breast, pain in axilla and arm.

Treatment.—Sept. 25th, 1929: I.R., 8 × 1·0 mg. 13·5/24·5 0·8 P. 10 days. 16 radon seeds 0·3 P. = 12·99 Mc.

Result.—Local recurrence disappeared, but pain not relieved. Died 10 months later of pulmonary metastases.

CASE 15 (1243).—Female, 43. Post-operative recurrence of carcinoma of breast. Pain in axilla and arm.

Treatment.—May 7th, 1930: I.R. of tumour, 15 × 1·0 mg 4/15 0·5 P. 7 days.

Result.—Local regression of recurrence. Pain made worse. Further recurrences later.

CASE 16 (1003).—Female, 48. Carcinoma of cervix uteri.

Treatment.—May 2nd, 1929: C.R., 1 × 50 mg. + 2 × 25 mg. 39 hrs. = 3900 mg. hrs.

Result.—Failure. Death five months later.

CASE 17 (1050).—Female, 53. Carcinoma of cervix, stage 2. Pain in back, groin, and leg.

Treatment.—July 9th, 1929: C.R. of uterus and vagina, 47½ hours. Uterus, 1 × 50 mg. Vagina, 1 × 25 mg. + 1 × 11 mg. + 5 × 4·4 mg. July 19th: pelvic gland dissection. C.R. of vagina, 2 × 11 mg. + 5 × 4·4 mg. 69 hrs.

Result.—Treatment followed by severe proctitis. Local condition improved. Patient still has pain; worse than before treatment.

CASE 18 (1077).—Female, 60. Carcinoma of cervix, stage 2. Pain in right leg.

Treatment.—Two applications of radium (C.R. of uterus and vagina).

Result.—Apparent cure. Pain persists, may not be due to growth.

CASE 19 (1171).—Female, 54. Carcinoma of cervix, stage 3. Pain in back and right thigh.

Treatment.—Two applications of radium (C.R. of uterus and vagina), followed by deep X ray therapy.

Result.—Growth not arrested. Pain not relieved, died after 10 months.

CASE 20 (1193).—Female, 42. Carcinoma of cervix, stage 3. Pain in hypogastrium and both groins.
Treatment.—Two applications of radium (C.R. of uterus and vagina), followed by deep X ray therapy.
Result.—Cervix healed. Pain not relieved, died six months later.

CASE 21 (1306).—Male, 49. Carcinoma of bladder. Pain in penis and hypogastrium.
Treatment.—August 6th, 1930: suprapubic cystotomy, diathermy excision. I.R. of base of growth, 14 × 6·5 mg. 15 0·5 P. 33 hrs.
Result.—Pain as severe as before treatment, in spite of permanent suprapubic drainage.

GROUP 2.—PAIN PRESENT BEFORE TREATMENT: RELIEVED

CASE 22 (1031).—Male, 60. Carcinoma of tonsil, recurrence after radon elsewhere. Pain behind angle of jaw. Right-sided trismus.
Treatment.—June 20th, 1929: I.R. of tonsil, 6 × 1 Mc. radon seeds. I.R. of neck, 10 × 0·6 mg. 6/16 0·5 P. 10 days. Oct. 19th: I.R. of primary, 6 × 2·0 Mc. radon seeds 12 × 0·6 mg. 6/16 0·5 P. I.R. of glands, 10 × 1·0 mg. 13·5/24·5 0·8 P. March 27th, 1930: I.R. of neck, 16 × 1·0 mg. 13·5/24·5 0·8 P. 7 days.
Result.—Ulcer healed after first I.R.; residual growth cleared up after second I.R.; trismus relieved, pain relieved. Glands disappeared after last I.R. Total dose: mouth 3600 mg. hrs. Neck 4300 mg. hrs.

CASE 23 (1063).—Male, 60. Carcinoma of tongue. Pain in tongue and referred to ear.
Treatment.—Feb. 22nd, 1929: I.R. of primary with radon seeds, 15 × 1·5 Mc. April 2nd: gland dissection. July 29th: I.R. of recurrence of primary. Six radon seeds, 1·3 Mc. each. Nov. 7th: recurrence in tongue, local and referred pain very severe. I.R., 5 × 2·0 mg. 22/32 0·5 P. 1560 mg. hrs.
Result.—Recurrence healed, pain completely relieved. Total dose: mouth 5600 mg. hrs.

CASE 24 (1103).—Female, 18. Sarcoma of palate. Pain in right side of face.
Treatment.—Oct. 12th, 1929: I.R. of tumour, 14 × 0·6 mg. 6/16 0·5 P. 1270 mg. hrs. August 1st: 12 × 0·6 mg. 6/16 0·5 P. 1100 mg. hrs.
Result.—Regression of tumour and relief of pain for several months, followed by recurrence treated elsewhere.

CASE 25 (1149).—Male, 75. Carcinoma of tongue and floor of mouth, local pain.
Treatment.—I.R. through submental region. Jan. 2nd, 1930: 11 × 1·0 mg. 13·5/24·5 0·8 P. 10 days = 2640 mg. hrs. Jan. 25th: I.R. tongue, 3 × 1·0 mg. 13·5/24·5 0·8 P. 10 days. S.R. of ulcer, 6 × 0·6 mg. 6/16 0·5 P. 9 days.
Result.—Primary healed, pain relieved, patient succumbed to glandular metastases in spite of several radium treatments.

CASE 26 (1289).—Male, 44. Carcinoma of tonsil. Very large fixed mass of glands, pain below left ear.
Treatment.—July 10th, 1930—
Tonsil .. I.R., 5 × 2·0 mg. 22/32 0·5 P.
Neck .. I.R., 8 × 3·0 mg. 45/60 0·6 P.
7 × 2·0 mg. 22/32 0·5 P. } 10 days.
Sept. 24th—
Tonsil .. I.R., 4 × 1·0 mg. 13·5/24·5 0·8 P.
Neck .. I.R., 7 × 3·0 mg. 45/60 0·6 P.
10 × 2·0 mg. 22/32 0·5 P.
1 × 1·0 mg. 13·5/24·5 0·8 P. } 184 hrs.
Result.—Primary and glands apparently cured. Pain continued three months and then ceased spontaneously. Patient now has pulmonary metastases.

CASE 27 (1109).—Female, 37. Skin. Recurrent rodent ulcer involving bone round orbit. Local pain.
Treatment.—Oct. 21st, 1929: S.R., 3 cm. 144 mg. 0·5 P. 1 mm. Pb. intermittently. Total 24,348 mg. hrs.
Result.—Apparent cure, relief of pain.

CASE 28 (1282).—Male, 61. Carcinoma of sebaceous glands, mastoid region, severe pain.
Treatment.—July 4th, 1930: I.R. of tumour—
4 × 3·0 mg. 45/60 0·6 P.
12 × 2·0 mg. 22/32 0·5 P.
3 × 1·0 mg. 4/15 0·5 P. } 6510 mg. hrs.
Result.—Regression of tumour and relief of pain.

CASE 29 (1102).—Female, 64. Post-operative recurrence of carcinoma mammæ, pain locally and down arm.
Treatment.—Oct. 9th, 1929: electro-coagulation and I.R. with radon seeds: 50 seeds 63·4 Mc.
Result.—Sloughing of growth, large ulcer, healing well, pain relieved. Patient died a few months later of generalised metastases.

CASE 30 (1151).—Female, 61. Post-operative recurrence of carcinoma mammæ. Pain in left axilla.
Treatment.—Operative exposure of apex of axilla. Jan 14th, 1930: I.R. of tumour, 10 × 1·0 mg. 4/15 0·5 P. 10 × 2·0 Mc. 20/30 0·5 Au. 10 days.
Result.—Regression of tumour. Pain relieved, arm paralysed.

CASE 31 (1223).—Female, 69. Primary carcinoma of breast. Pain in breast.
Treatment.—April 11th, 1930: I.R. of tumour and lymphatic field—
7 × 3·0 mg. 45/60 0·5 P.
25 × 1·0 mg. 13·5/24·5 0·8 P.
30 × 1·0 mg. 4/15 0·5 P. } 7 days.
Result.—Apparent cure, pain relieved.

CASE 32 (1085).—Female, 46. Carcinoma of cervix, stage 2. Pain in hypogastrium.
Treatment.—Two applications of radium (C.R. of uterus and vagina).
Result.—Apparent cure, pain relieved.

CASE 33 (1118).—Female, 66. Carcinoma of cervix, stage 4. Pain in hypogastrium.
Treatment.—Two applications of radium (C.R. of uterus and vagina) followed by deep X ray therapy.
Result.—Arrest of growth, relief of pain.

GROUP 3.—PAIN AFTER TREATMENT.

CASE 34 (1107).—Male, 60. Carcinoma of tonsil treated elsewhere with radon. Glandular metastases.
Treatment.—May 14th, 1929: I.R. of glands, 10 × 1·0 mg. 13·5/24·5 0·8 P. 10 days. August 24th: I.R. of glands, 12 × 1·0 mg. 13·5/24·5 0·8 P. 10 days.
No pain after first I.R. Second treatment followed by dense fibrosis in neck and pain in distribution of cervical plexus. Death 12 months later; growth arrested, but not cured.

CASE 35 (1013).—Male, 52. Carcinoma of pharynx. May 24th, 1929: gland dissection, lateral pharyngotomy. I.R. of exposed tumour, 6 × 0·6 mg. 6/16 0·5 P. 140 mg. hrs. July 3rd: S.R. of ulcer through fistula, 12 × 1·0 mg. 13·5/24·5 0·8 P. 8 days. Sept. 19th: S.R. of ulcer, 5 × 4·4 mg. 0·3 P. 1727 mg. hrs. April 30th, 1930: I.R. of recurrence in neck, 8 × 1·0 mg. 12·5/25 0·5 P. 10 days.
Result.—Growth apparently arrested for a time, began to have pain after first treatment, very severe after last treatment. Death two months later from hæmorrhage.

CASE 36 (1015).—Male, 69. Carcinoma of soft palate.
Treatment.—May 27th, 1929: I.R. of primary, 9 × 0·6 mg. 6/16 0·5 P. 620 mg. hrs. June 10th: prophylactic I.R. of glands, 30 × 1·0 mg. 13·5/24·5 0·8 P. 7 days. Sept. 13th: I.R. of recurrence of primary, 8 × 0·6 mg. 6/16 0·5 P. 690 mg. hrs.
Result.—Apparent cure. Patient has had pain in neck since I.R. of glands. It is becoming easier. There is some subcutaneous fibrosis on both sides of neck. One needle had to be cut out owing to a broken thread.

CASE 37 (1049).—Female, 48. Carcinoma of gum.
Treatment.—July 3rd, 1929: I.R. of primary, 8 × 0·6 mg. 6/16 0·6 P. 920 mg. hrs. Sept. 18th: gland dissection. Jan. 1st, 1930: I.R. of recurrence, 14 × 0·6 mg. 6/16 0·6 P. 7 days. Jan. 27th: S.R., Columbia paste, 2 cm. 131 mg. 5 days.
Result.—Primary healed, developed bilateral glandular metastases of rapid growth, painful. No pain before metastases appeared.

CASE 38 (1075).—Male, 71. Post-operative recurrence, carcinoma of pharynx.
Treatment.—August 21st, 1929—
I.R., 0·5 × 1·0 mg. 13·5/24·5 0·8 P.
+ 12 × 0·6 mg. 6/16 0·5 P. } 7 days.
April 16th, 1930: I.R., 12 × 1·5 mg. 10/20 0·5 P. 7 days.
Result.—Lump became smaller and fibrosed at time of second I.R. Patient had pain in shoulder and behind his ear. This was not relieved by second treatment and continued until death eight months later.

CASE 39 (1086).—Male, 59. Carcinoma of tongue.
Treatment.—Sept. 20th, 1929: I.R. of tongue, 10 × 1·0 mg. 13·5/24·5 0·8 P. + 2 × 0·6 mg. 6/16 0·5 P. S.R. of ulcer, 18 × 0·6 mg. 6/16 0·5 P. 7 days. Oct. 26th: bilateral gland dissection. I.R. of wound, 13 × 1·0 mg. 13·5/24·5 0·8 P. 7 days. June 10th, 1930: I.R. of recurrence in neck—
9 × 2·0 mg. 22/32 0·5 P.
1 × 0·6 mg. 6/16 0·5 P. } 7 days.
Result.—Primary healed. No pain until after I.R. on June 10th, which was followed by severe pain in shoulder

first experienced while needles were in. Growth not arrested, death four months later. Pain not relieved.

CASE 40 (1115).—Male, 51. Carcinoma of palate, tonsil, and cheek.

Treatment.—Nov. 9th, 1929: S.R. of ulcer. Radon seeds on dental bridge 24 Mc. 23 seeds. 200 hrs. Nov. 14th: partial gland dissection, I.R. of wound. 12 radon seeds 15·6 Mc. Jan. 17th, 1930: I.R. of residual ulcer, 13 × 0·6 mg. 6/16 0·5 P. 7 days. April 16th: I.R. of neck, 20 × 1·0 mg. 4/15 0·5 P. 7 days. Sept. 10th: I.R. of ulcer, 6 × 2·0 mg. 22/32 0·5 P. 6 × 1·5 mg. 10/20 0·5 P. I.R. of neck, 7 × 3·0 mg. 45/60 0·6 P. 7 days. 8 × 2·0 mg. 22/32 0·5 P.

Result.—Growth apparently arrested. Radium ulcer at site of primary, no recurrence in neck. Patient has severe pain in mouth, neck, and ear; first noticed before last treatment, more severe since.

CASE 41 (1166).—Male, 78. Post-operative recurrence of carcinoma of tongue.

Treatment.—Jan. 31st, 1930: I.R. of tongue, 12 × 1·0 mg. 13·5/24·5 0·8 P. 8 × 0·6 mg. 6/16 0·5 P.

Result.—Apparent cure, painful radium ulcer produced which took several months to heal. Patient now free from pain.

CASE 42 (1062).—Female, 60. Post-operative ulcerated recurrence of carcinoma of breast.

Treatment.—August 2nd, 1929: I.R. of recurrence, 5 × 1·0 mg. 13·5/24·5 0·8 P. + 12 × 0·6 mg. 6/16 0·5 P. 7 days. Metastases in posterior triangles later treated by X rays.

Result.—Ulcer did not heal; recurrence spread. Pain started about three months later in arm, which became weak, almost certainly due to involvement of brachial plexus by growth. Death one year after I.R.

CASE 43 (1134).—Female, 65. Primary carcinoma of breast.

Treatment.—Dec. 9th, 1929: I.R. of tumour and lymphatic field—

30 × 1·0 mg. 13·5/24·5 0·8 P.
26 × 0·6 6/16 0·5 P. } 208 hrs.

Feb. 26th, 1930: I.R. of axilla, 9 × 1·0 mg. 13·5/24·5 0·8 P. 10 days. March 15th: S.R. of whole area, 3 cm. 200 mg. 124 hrs. June 14th: I.R. of pectorals—

7 × 3·0 mg. 46/60 0·6 P.
5 × 2·0 mg. 22/32 0·5 P. } 7 days.

Result.—Growth arrested, hard mass persists in pectoral muscles, with deep radium ulcer penetrating to ribs. Has complained of pain in shoulder since second I.R. Pain in axilla and arm before last treatment, worse since. The radium ulcer is also painful at times.

CASE 44 (1014).—Female, 40. Carcinoma of cervix, stage 2.

Treatment.—May 23rd, 1929—

C.R. uterus, 1 × 5·0 mg.
I.R. cervix, 2 × 25 mg. + 5 × 4·4 mg. } 28¾ hrs.

June 6th: Wertheim hysterectomy.

Result.—Did well for a few months; developed recurrence, with pain in distribution of left sciatic nerve. Death one year, five months after C.R.

CASE 45 (1227).—Female, 55. Carcinoma of cervix, stage 3.

Treatment.—Two applications of radium (C.R. of uterus and vagina) followed by deep X ray therapy.

Result.—Temporary improvement; pain in groins started five months after second C.R., and later spread in distribution of left sciatic nerve.

CASE 46 (1270).—Female, 58. Carcinoma of cervix, stage 3.

Treatment.—Same as last case.

Result.—Local condition improved. Pain in groins started three months after second C.R. Patient is going downhill, pain becoming worse.

CASE 47 (1073).—Female, 70. Carcinoma of middle ear, radical operation followed on August 21st, 1929, by prophylactic I.R., 4 × 1·0 mg. 13·5/24·5 0·9 P. 7 days.

Result.—No recurrence. A year later complained of pain in scar.

CASE 48 (1245).—Female, 57. Extensive carcinoma of anus.

Treatment.—May 8th, 1930—

I.R., 7 × 3·0 mg. 45/60 0·5 P.
20 × 1·0 mg. 13·5/24·5 0·8 P.
20 × 0·6 mg. 6/16 0·5 P. } 7 days.

May 23rd: 7 × 3·0 mg. 45/60 0·5 P. 7 days.

Result.—Growth apparently arrested, large cavity persists which is painful. No progress for several months.

CASE 49 (1036).—Male, 61. Multiple rodent ulcers. Many lesions treated satisfactorily. Radium burn produced on chest by S.R. (after previous X rays), 10 × 5·0 mg. at 1 cm. distance 40 sq. cm. area. 72 hrs.

This burn has been painful and is very slow in healing.

Analysis of Results and Commentary.

GROUP I.

Of the 21 cases in which pain was relieved 11 died—the majority after a short period. In none of these 11 cases was there any apparent benefit from the treatment, whatever the effect of radiation on the tumour. In three cases the pain was worse after than before treatment (Cases 2, 5, 6). In Cases 5 and 6 the increase of pain may have been due to the progress of the disease alone. In Case 2, however, there is little doubt that the patient's suffering was aggravated and prolonged by the repeated treatments. In a case like this, where each treatment produces a temporary improvement as judged by regression of the tumour, it is difficult to refuse further treatment. Other cases show the possibility of success with repeated treatments—e.g., Cases 22 and 23. It is to be noted, however, that the total dose in these cases was about 4000 mg. hrs., whereas in Case 2 it was 17,000 mg. hrs. which, even considering the large size of the tumour was excessive. True radionecrosis, the result of overdosage, is nearly always painful, and nice judgment is required to decide how far one can go without producing this sequel and when the risk is justifiable. It is useless to set a maximum in any terms beyond which it is impossible to go without producing necrosis, so variable is the resistance of the tissues. In Case 41 a dose of 3800 mg. hrs. with well-screened needles of low intensity produced necrosis in the posterior third of the tongue which took months to heal. The patient is now, however, free from pain and any sign of growth. In other cases larger doses have been given without necrosis resulting. There is little doubt, however, that Case 2 would have had serious necrosis had he survived.

Of the 10 cases still living in this group two have slight pain only and need not be classed as failures (Cases 9 and 18). The remaining eight patients still have severe pain. In all of them life has probably been prolonged and in five cases the pain is worse than before treatment. Of these five, three are not likely to live long. Five patients are in good general health, three with persistent, two with aggravated pain. These five have no sign of active growth. They are successes in so far as arrest of the tumours is any criterion, but are failures in that they are incapacitated by pain (Cases 3, 8, 10, 11, and 21). Four of them are head cases. In Case 3 (referred pain from tongue) the dose applied to the tongue was arge: 5600 mg. hrs. in three applications. In Case 8, with pain in the neck, a dose of 16,100 mg. hrs. was applied to a very large mass of glands. In both these cases irradiation has been followed by very dense fibrosis in the tissues occupied by the growth. In Case 10 the pain is in the upper jaw and may be due to necrosis of bone; the dose of radium was small but the patient also had X ray treatment. In Case 11 the disease is characterised by infiltration of the nerves at the base of the skull, and it is impossible to exclude this as the cause of the trigeminal pain. In only two cases (3 and 8) is it probable that the continuation of pain is due to overdose. Neither shows any radiographic evidence of necrosis of bone and in both cases the primary lesion, an ulcerated carcinoma, is healed.

In this group, then, in eight cases life has been prolonged without relief of pain and in eight cases the patient's suffering has apparently been aggravated by treatment. The five cases living, although without evidence of active disease, must be classed as failures

unless the pain subsides and the growth remains in abeyance. The possibility of this happening when the pain is due to a radio-lesion is shown by Case 41, but where the only apparent lesion is a dense fibrosis the outlook seems less hopeful.

GROUP 2.

Of the 12 cases in which pain was relieved two are dead and 10 are alive, and of these five are apparently cured. In three of the mouth cases pain was of the referred type, showing that this condition can be relieved by radium. In these cases (22, 23, and 24) the dose applied to the primary lesion was 4130 mg. hrs., 3790 mg. hrs., and 2400 mg. hrs. respectively. The fact that in Cases 22 and 23 success was obtained with repeated treatments has already been mentioned. There was no evidence of decrease of radiosensitivity in these cases. Case 26 is of interest in comparison with Case 8 in Group 1. The two cases were clinically almost identical. In Case 26 the pain ceased spontaneously about three months after treatment; in Case 8 it persists. The dose was slightly larger in Case 26. In both cases a very large mass of glands has resolved, leaving dense fibrosis in the tissues of the neck. The two cases of carcinoma of the cervix uteri had hypogastric pain only. In no case of this disease has the pain in groins and legs due to involvement of nerves been relieved. In the two skin cases (27 and 28) pain was apparently due to involvement of bone. In Case 27 this was relieved without the occurrence of necrosis. In Case 28 the relief was temporary only and pain has recently recurred, perhaps due to necrosis of bone.

The chief interest of this group in the present inquiry is to discount the influence of factors that might be held responsible for pain. Six out of the 10 patients had repeated treatments. Two of the most successful cases (22 and 23) were treated twice with radon seeds screened only with 0·3 mm. of platinum. The series illustrates too the possibility of a perfect palliative result in the most hopeless cases. One point seems worthy of note: no very large total doses were given in this group, except in Case 26, to the glands. In Cases 29 and 31 the field of irradiation was large.

GROUP 3.

Of the 16 cases in this group only four show no evidence whatever of the persistence of growth—viz., 36, 41, 47, and 49. In Cases 36 and 47 the issue is complicated by operative procedures: in the former an incision for removal of radium needles (broken threads); in the latter a radical operation preceding irradiation. The dose in both was small and the pain is not incapacitating. In Case 41 the pain subsided after the healing of radio-necrosis. This and Case 49—a radium burn following surface irradiation of a rodent ulcer—are the only cases in which radium alone was the cause of pain. In two other cases (40 and 43) the growth has apparently been completely arrested. Both have severe radio-necrosis, Case 40 a large ulcer in the mouth,[1] Case 43 a deep ulcer penetrating the pectoral muscles. Both lesions are surrounded by dense fibrosis in which it is impossible to say that there is no growth. The necrosis would, however, in the absence of growth, be adequate cause for the pain. This dense fibrosis has been observed in other cases in this group (34, 35, 38, and 42). These patients have all died, but it was noticed after irradiation that the tumours became more scirrhous in type, as if the treatment, while failing to sterilise the tumour, was able to induce in the tissues a higher degree of resistance. In each of these four cases the lesion was in the neighbourhood of a large nerve plexus and the character of the pain suggested involvement of the nerve plexus as a cause. Such pain may be observed in malignant disease in the absence of irradiation, but it is possible that the latter intensifies pain in these cases by increasing the fibrosis in the growth around the nerves. There is no justification for supposing that the treatment alone is responsible for the pain—i.e., that similar irradiation of a healthy individual would produce the same sequel.

In one case (39) pain came on during treatment with a definite and persistent distribution, and it is almost certain in this case that branches of the brachial plexus were directly injured by the needles. In the remaining cases there was obvious extension or recurrence of the growth, sufficient to account for the pain, and there was no evidence that this was caused or aggravated by irradiation.

In this group, then, there are five cases in which irradiation is definitely a cause of pain, though not necessarily the only cause. One of these patients is cured of his pain, one has died, the other three survive with every prospect of continuing to do so.

SUMMARY OF RESULTS WITH REFERENCE TO DURATION OF LIFE AND PAIN.

Group 1, 21 Cases.

	Cases.
Dead, 11 cases:—	
Pain aggravated, life prolonged	1
Pain aggravated, life not prolonged	2
Pain not aggravated, life prolonged	2
Pain not aggravated, life not prolonged	6
Living, 10 cases:—	
Pain aggravated, disease not cured	3
Pain aggravated, disease apparently cured	2
Pain not aggravated, disease apparently cured	3
Pain ameliorated, disease apparently cured	2

Group 2, 12 Cases.

	Cases.
Dead, 2 cases:—	
Life prolonged	1
Life not prolonged	1
Living, 10 cases:—	
Disease apparently cured	5
Disease not cured, life prolonged	5

Group 3, 16 Cases.

	Cases.
Dead, 7 cases:—	
Life prolonged	2
Life not prolonged	5
Living, 9 cases:—	
Apparently cured	4
Not cured, life prolonged	5

Summary.

1. A series of cases treated by irradiation in which pain occurred before or after treatment is examined in detail.

2. Radium treatment is able to relieve deep-seated and referred pain due to malignant disease.

3. The only painful sequelæ that can be attributed solely to radium are: (*a*) radio-necrosis; (*b*) direct injury to nerves.

4. In some cases temporary arrest of a tumour is obtained without relief of pain and the suffering of the patient is prolonged.

5. By increasing the fibrous tissue reaction to a growth radium may aggravate pain due to pressure on nerves.

6. The only factor in treatment that seems constantly to determine a painful sequel is such gross overdosage as to produce radio-necrosis.

7. There is no evidence that repeated treatment is harmful—much less that it is useless—provided that the total dose is not such as to produce necrosis.

I am indebted to the surgeons of University College Hospital for permission to make use of their cases in this investigation.

[1] In Case 40 the whole lesion was subsequently excised. Numerous sections showed no evidence of carcinoma.

STAPHYLOCOCCAL INFECTION AND ANTITOXIN TREATMENT.

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We have shown elsewhere [1] that an animal repeatedly injected intradermally with *Staphylococcus aureus* acquires a partial immunity, as evidenced by the presence of antibodies in its blood and the development of a smaller skin lesion in response to a measured dose of cocci, but that it also acquires an increased sensitivity to the bacterial dose, as shown by the development of lesions after injection of 1/100th the minimal infecting dose for the normal animal. This increased sensitivity to infection in a partially immunised animal or in man is probably an important factor in relapsing staphylococcal infections, and one obviously difficult to counteract.

The present investigation is directed primarily to the parts played by the pigment and by the extracellular toxin in the infective process.

RÔLE OF THE PIGMENT.

The pigment was readily extracted from cultures provided they were of recent growth. The solid growth on agar was washed off in saline, ground up in plaster-of-Paris, extracted with acetone and filtered. The sterile filtrate was dried and suspended in saline for injection. Rabbits were injected both intradermally and intravenously with the pigment without any local or general effect. Repeated intradermal injections produced no sensitivity either to the pigment or to the dosage of living cocci, nor was any immunity produced. A rabbit inoculated in one area of the skin with *S. albus* alone, and in another area with *S. albus* plus *aureus* pigment, developed similar lesions from the two inoculations. Human beings, whether susceptible to *aureus* infections or not, gave completely negative skin reactions to intradermal injections of the pigment. The toxin production of *S. aureus* appears to be independent of the pigment and F. M. Burnet obtained abundant toxin from *albus* variants. Dr. Campbell Smith kindly examined the pigment for us. Photometrical examination of the spectrum showed an absorption band with its maximum about 4900 Å. A similar band at this wave length is given by carotin.

We conclude that the pigment has neither toxic nor antigenic properties and is of the nature of carotin.

RÔLE OF THE EXTRACELLULAR TOXIN.

The extracellular toxin produced by *S. aureus* has powerful necrotic, hæmolytic, and lethal actions. Its action and mode of production have been fully described by Walbaum [2] and Burnet.[3] The following simple method of obtaining the toxin used by us is similar to that of Burnet.

1·25 per cent. agar plates at pH 7·2, thickly inoculated, were placed in jars above an excess of $CaCO_3$. Sufficient HCl to give a 20 per cent. atmosphere of CO_2 was run down the side and the jar at once closed and incubated for 48 hours. The agar was cut into small pieces and sucked through a conical Buchner funnel to break it up. It was then filtered through paper in wide Buchner funnels and the filtrate passed through a Seitz filter for sterilisation. It is most important to bring the reaction of the filtrate to pH 6·5–7 as early as possible in the process as the toxin is destroyed if it is allowed to remain alkaline.

The toxin was standardised by testing varying dilutions against washed rabbit cells in final 1 per cent. suspension. The mixture stood at 37° C. for one hour and was then shaken up and kept over night in the refrigerator. The result was read next morning, the last tube showing complete hæmolysis indicating the titre. Our freshly prepared toxin usually went to 1/1000 approximately, but the titre slowly falls off with keeping. Contamination makes less difference to the titre than might be expected.

The strains of *S. aureus* used were obtained from human lesions and the variation in the amount of toxin production by different strains was great and did not correspond to the severity of the lesions from which they were derived.

Intradermal injection of 0·2 c.cm. of toxin in a rabbit gives rise in 24 hours to an area of necrosis often 2 in. or more in diameter, reaching its maximum in about 48 hours and healing subsequently by separation of the slough. Intramuscular injection produces a local area of necrosis. Intravenous injection of 2 c.cm. of toxin led, as a rule, to convulsions coming on in a few minutes which might result in the death of the animal 10 minutes after the injection.

Repeated intradermal injection of rabbits with graded doses of standard toxin resulted in a similar immunity to that following graded injections of the living coccus but no evidence of hypersensitivity to dose was obtained. Smaller lesions resulted from the second or third repetition of the stronger toxin, and no lesions at all from the more dilute. If, however, a rabbit which had received a series of toxin injections was then tested with graded doses of the living coccus, it usually reacted to a lesser dose of the coccus than the control animal. This state of hypersensitivity was neither so constantly induced nor of the degree observed in rabbits sensitised by the living coccus alone. The toxin-immunised rabbits might react to 1/10th the minimal infective dose, never to 1/100th.

The following single example may be given :—

Rabbit, CL 302.

Date.	Dilutions—			
	Toxin.			
	1/1	1/10	1/50	
March 3rd, 1930..	+ + +	+	+	
,, 18th, ,, ..	+ + +	+	—	
April 1st, ,, ..	+	+	—	
,, 29th, ,, ..	+	—	—	
	Coccus.			
	1/1	1/10	1/100	1/1000
May 6th, ,, ..	+	+	+	—
Control.				
	Coccus.			
	1/1	1/10	1/100	1/1000
	+ +	+	—	—

The number of + indicates the size of the lesion. The coccal dilutions are those of a freshly prepared standard suspension in saline.

Repeated intramuscular or intravenous injection of the toxin was followed by the appearance of agglutinins and by a state of partial immunity.

The sera of rabbits thus immunised neutralised toxin in vitro, as shown by the failure of the mixture after incubation to hæmolyse red cells, and in vivo by the absence of necrosis on intradermal injection of the mixture. In none of our animals did the antitoxic value of the sera reach a very high titre. No attempt was made to separate the necrotic function from the hæmolytic since both appeared to vary together in the samples tested, although recent evidence [4] would seem to show that the necrotic and hæmolytic toxins are distinct. The titre was arrived at by the following method which depends upon the neutralisation of the hæmolytic action of the toxin.

Dilutions of the antitoxic serum were incubated with a fixed dilution of the toxin for one hour. Rabbit cells were then added to each tube to give a final 1 per cent. suspension and the tubes incubated for one hour, shaken up and left in the refrigerator over night. The last tube showing no hæmolysis indicates the protective power of the serum. The toxin was titrated again at the same time. Thus a horse serum originally giving no hæmolysis up to 1 in 16 against toxin 1 in 8 (final dilutions), after immunisation gave a titre of 1 in 128.

THERAPEUTIC APPLICATIONS.

The production of staphylococcal antitoxin has been effected by others but no purely antitoxic serum suitable for therapeutic use was, to our knowledge, available. We therefore discussed the matter with Dr. G. F. Petrie and he very kindly undertook to immunise a horse for us at the Lister Institute at Elstree. The animal was immunised by intramuscular injections of toxin and finally yielded a serum of high antitoxic value.

Dr. J. R. Marrack kindly fractionated this serum for us. The precipitate obtained from half-saturation with ammonium sulphate was redissolved and dialysed against distilled water. This left the pseudo-globulin in solution and a precipitate of eu-globulin which was redissolved separately. On testing these solutions against toxin the antitoxin was found in the pseudo-globulin fraction. The agglutinin of the antiserum appeared to be attached to the eu-globulin and not to the pseudo-globulin.

Dr. Petrie then prepared a concentrated serum which was found on repeated titration to be nearly three times as rich in antitoxin as the original serum. Pending the preparation of the concentrated product the raw serum was used in the first cases treated.

Anatoxin was prepared by the addition of 0·2 per cent. formalin to the toxin. It was found that after two to three days' incubation all hæmolytic power had disappeared. A rough test was carried out to discover whether the anatoxin, if present, could neutralise antitoxin in vitro. Anatoxin was incubated with dilutions of antitoxin, the toxin was added, the tubes reincubated and finally tested as usual with rabbit cells. As a control, similar dilutions of antitoxin were incubated with equal amounts of toxin only. It was found that hæmolysis went further in the tubes containing anatoxin to an extent roughly indicating that the anatoxin neutralise 3/7 of the amount of antibody neutralised by the corresponding toxin, from which the anatoxin had been prepared.

The anatoxin was tested on the human skin and compared with the untreated toxin. It was found that the toxin was ten times as active as the anatoxin.

A series of skin tests in men was carried out with diluted toxin. An intradermal injection of 0·1 c.cm. of 1 in 100 toxin was found to be suitable. The result can be read 24 to 48 hours later. Nine laboratory workers were first tested, some of them with slight existing or recent staphylococcal infections. Only one test was negative, in the case of a man who had never had boils. All the others were positive, a strong reaction usually accompanying a history of recent infection. Similarly four patients suffering from small staphylococcal lesions such as boils and sycosis barbæ gave strong reactions. With patients suffering from staphylococcal septicæmia or protracted pyæmia with metastatic abscesses, the skin test has been negative. We have tested only four such cases but the results were so uniform and so much in accordance with the patient's lack of resistance that a negative response may be taken as the rule in such cases. We have unfortunately been able to test only one case of carbuncle. If these cases are to be treated with antitoxin it is not justifiable to wait for the result of a skin test. In our case we withheld serum to see the result of the uncomplicated test which was feebly positive. There was some spread of the lesion during the interval. Probably a positive skin test does occur in cases of carbuncle except in the very severe infections producing septicæmia.

In general, the course of immunity as evidenced by the skin test appears to be similar in staphylococcal infections and in tuberculosis. A positive result is found with mild and medium lesions, persisting for years, though growing weaker. A general infection gives a negative reaction as is found in miliary tuberculosis. Very few people have never had any staphylococcal infection, but one such case in our series gave a negative reaction.

From the foregoing, certain theoretical considerations arise bearing upon the specific treatment of staphylococcal infection in man.

Any staphylococcal lesion is likely to leave a partial immunity to the toxic action of the bacteria, coupled with a liability to fresh lesions from small doses. On theoretical grounds such combination of immunity and hypersensitivity might result from vaccine therapy, and in our experience has seemed in certain cases to have resulted.

It is probable that a passive immunity can be realised by means of an antitoxic serum in acute infections, and we are attempting to produce an active immunity by injections of toxin rather than of vaccine in a few selected cases which are still under observation.

TREATMENT BY ANTITOXIC SERUM.

The serum used by us is purely antitoxic and has no bactericidal properties. When tested in vitro, staphylococci grow freely in it. We have used it only in acute and severe local lesions, such as the carbuncle, and in general blood infections. In all but one case the injections were intramuscular.

CASE 1.—Aged 48, a wasted woman of very poor physique. Two weeks' history of pain and swelling on the right side of the back. On admission there was a very extensive carbuncle on the back measuring approximately 6 by 3 inches. Temperature 100·6° F. Pulse-rate 100. Two doses of 10 c.cm. of serum were given with a day's interval between the doses. The slough separated with remarkable speed, and a large healthy granulating wound was present one week after the first dose of serum. The temperature had returned to normal before the second dose of serum was given. The granulating surface healed over after about the usual time, and recovery followed without complication.

CASE 2.—Aged 64, a stout woman with a 13 years' history of diabetes. The carbuncle on the neck started three weeks before the serum treatment, and when the treatment was begun the slough measured 4 by 2½ inches, and was surrounded by an indurated area extending outwards from 2 to 3 inches farther. Two 10 c.cm. doses of serum were given, the second dose being of the concentrated serum. On the day following the second dose the inflammatory zone had disappeared and the slough had almost separated. The further course was uneventful and rapid.

CASE 3.—Aged 50. A stout man with diabetes and an alcoholic history. He had had a carbuncle on the back of his neck for two weeks. On admission the carbuncle had a central necrotic area of 2 inches in diameter surrounded by an inflammatory zone measuring 8 by 6 inches. He was delirious on admission. Three 10 c.cm. doses of serum were given on successive days, and although there was some temporary improvement, after the first day the carbuncle continued to spread. Four days after the last dose of antitoxin he developed signs in the chest, and died on the following day. In spite of insulin, the diabetes was never brought under control. At autopsy pyæmic abscesses were found in the lungs, heart, and kidneys.

CASE 4.—Aged 46. A stout woman, an old case of diabetes. A carbuncle on the neck had started two weeks before, and on admission was about 2½ inches in diameter, with the centre beginning to break down. She was given three doses of 10 c.cm. of purified antitoxin on successive days, after which the edges of the lesion appeared to have stopped spreading, though very little sloughing occurred. During the next week the edges began to spread again, and a month elapsed before satisfactory sloughing occurred. The diabetes in this case was controlled throughout.

CASE 5.—A man, aged 21. He had had a painful swelling on the back of his neck for 13 days. A crucial incision had been made by his doctor five days before admission. Before the age of 15 he had been much troubled by recurrent boils on the back. On admission there was a carbuncle about 2½ inches in diameter on the nape of the neck. It was discharging freely through the incision. Temperature 100·2° F. Pulse-rate 100. On the day of admission 30 c.cm. of serum were given and on the following day 20 c.cm. more. Three days after the last dose there was still no change in the general and local condition. And the condition did not finally clear up for two and a half weeks, during which time two further incisions had to be made.

CASE 6.—Aged 17, a probationer nurse. On Jan. 15th she fell on her right wrist and developed pneumonia the same night. On Feb. 4th a rib resection for empyema was performed and an abscess on the right wrist opened. The empyema pus grew *S. aureus* and *B. influenzæ*, and the abscess culture gave *S. aureus* only. On Feb. 11th large subcutaneous abscesses on both hips were opened, the pus growing *S. aureus*. She was first seen by us on Feb. 12th, when a skin test with staphylococcal toxin was found to be negative. 10 c.cm. doses of raw antistaphylococcal serum were given on the 13th, 15th, and 17th, and on the 17th an abscess was opened on the left foot. The skin test on the 18th was still negative. The general condition at this time seemed to have improved, although the temperature and pulse-rates were still raised. During the next week the improvement was steady, and she went to a convalescent home on March 19th, all the wounds being healed. At no time was a positive blood culture obtained.

CASE 7.—A man, aged 18. Admitted on Jan. 22nd after three weeks' pyrexia, with much sweating, and pain in the left thigh, and with a four days' history of swelling over the right sterno-clavicular joint. He appeared to be very ill on admission and the temperature was swinging up to 102° F. Small pustules were present on the face and back of the neck. On Jan. 26th a lump in the neck was aspirated; thin pus was found, growing *S. albus* only. On Feb. 3rd there was swelling of the left elbow. On Feb. 12th a swelling in the right iliac fossa just above the pubis was found. It was hard, tender, and thick. On Feb. 20th this swelling was incised and pus was found under the pubic periosteum, and the abscess was drained. The pus grew *S. albus*, yielding hæmolysin. The temperature remained high and swinging, and the swelling persisted in the elbow. A blood culture on March 14th was sterile. Between March 21st and March 24th four 10 c.cm. doses of raw antistaphylococcal serum were given. The temperature remained high until April 2nd, after which a steady and complete recovery followed.

CASE 8.—A boy, aged 10. Admitted May 7th, 1931. Two weeks previously he fell when skating and hurt his right arm. May 2nd: Pain in left groin especially when standing on left leg. In bed. May 6th: Drowsy with some vomiting. Admitted with vague tenderness round left hip. May 8th: Blood culture grew *S. aureus*. 11th, 12th, 13th, 16th, 17th: 10 c.cm. antistaphylococcal serum. Before giving serum the condition seemed to be acutely dangerous, but following serum treatment the clinical condition became stabilised, although the temperature remained swinging up to 101° F., and the pulse fairly high. During this period there was pain in both wrists and in the right ankle. May 16th: Swelling on the right ankle was incised, but only sterile serum exuded. May 26th: Swelling over lower end of right tibia was incised but the bone was healthy. No definite metastatic abscess occurred, although the temperature had persisted with diminishing evening rise until July 24th. At the end of July a second course of antitoxin was given without appreciable result. There have been effusions into joints, and the urine has contained pus and *S. aureus* in very large numbers, as indicated by direct inoculation into melted agar. Apart from the œdema round the right ankle there were never any localising signs, but recent radiograms have shown that the following bones were involved: both femurs, both acetabula, the lower ramus of the left pubic bone, and the right fibula.

CASE 9.—A girl, aged 16, on July 17th, 1931, twisted her ankle without apparent injury to the knee. Next day the knee was painful, and on admission on the 24th it was inflamed, her temperature was 101° F. and pulse-rate 124. On the 25th she was worse, and blood culture grew *S. aureus*. The knee was opened and drained, causing some general improvement, though the temperature and pulse-rate remained high. On the 29th the general condition was still unsatisfactory, and 30 c.cm. concentrated antitoxin were given on each of three days. The temperature and pulse-rate dropped somewhat but rose later owing to unsatisfactory drainage, but the general condition improved, her appearance suggesting a severe local rather than a general infection. On August 24th the knee was again incised and superficial pus was found. The temperature became normal, though the pulse remained high. No metastatic abscess occurred. The further progress of the case has been uneventful.

CASE 10.—A man, aged 28, was admitted on August 18th, 1931, with a four weeks' history of superficial infection on the right elbow following a graze. He had been ill for four days with cough, sweating, and pain in the right chest. On admission he was very ill, with temperature 102·5° F., pulse-rate 124, and respirations 50. Apart from very profuse sweating the condition resembled lobar pneumonia. The arm showed a superficial cellulitis, and cultures from the arm and the blood grew *S. aureus*, which was also present in the sputum. On the 18th, 19th, and 22nd he received concentrated antitoxin, 20 c.cm. each time. There was much less sweating on the following days, but the patient remained very ill. On the 21st an abscess developed on the arm, was opened up and drained, and soon cleared up. On the 23rd an almost painless abscess developed between the scapulæ, and was opened on the 26th. Sept. 3rd, temperature 99–100°, respiration 32. The patient was still very ill and an empyema was suspected. The sputum was purulent. The case was probably one of those, usually rapidly fatal, in which the septicæmia causes multiple small pulmonary abscesses. This patient may have acquired some immunity during the month's infection of the arm before the general invasion occurred. The temperature continued to swing up to 101° for three weeks but the general condition gave no anxiety, and an uneventful recovery took place.

FIG. 1.

Radiogram of pelvis and hip-joints.

CASE 11.—A boy of 16 had had pain in the right thigh for seven days before admission. During this time he had had a high temperature and had slept little. On examination there was great toxæmia and jaundice. Temperature 103–105° F. Pulse-rate 120–140. The blood culture grew *S. aureus*. At operation the right thigh was extensively infiltrated with pus, and there was extensive osteomyelitis of the femur. An injection of 30 c.cm. of serum was given on the day of the operation and another injection of 20 c.cm. on the following day. There was no improvement and he

died 48 hours later. At autopsy there were pyæmic abscesses in the heart, lungs, kidneys, and thyroid.

CASE 12.—A boy of 10 had had a painful swelling of the lower lip for five days. On admission the lower lip was tense and discharging pus at several places. Temperature 102·5° F. Pulse-rate 116. He appeared to be very ill. Death occurred after 48 hours, an injection of serum having had no result.

CASE 13.—A girl, aged 13, had extensive cellulitis of the right side of the face, and died on the day following admission. An intravenous injection of 10 c.cm. of serum soon after admission had no effect.

FIG. 2.

Radiogram of lower end of tibia and fibula.

The cases treated fall into three groups, and they are arranged in that order above: cases of carbuncle (Cases 1 to 5); cases of staphylococcal septicæmia and pyæmia (Cases 6 to 10); and finally cases of a fulminating character in which there was very little hope that any treatment could be effective (Cases 11 to 13). To assess the effect of a particular kind of treatment in acute bacterial infection is obviously difficult. The virulence of the infection and the resistance of the patient are two factors that are incapable of measurement, and it is therefore impossible to employ controls. A good example of this is the ordinary case of acute osteomyelitis in which, before the bone is exposed, the blood culture is positive in about 90 per cent. of cases. The patient therefore has a septicæmia, but fortunately in the ordinary case this has no bad prognostic significance. On the other hand there are cases with a positive blood culture in which the prognosis is obviously grave. The distinction between these two types is observed clinically. We have no other test than the blood culture.

The results obtained in cases of carbuncle have been indefinite. The first patient who had serum undoubtedly benefited. There was an immediate improvement in the general condition, but the most noteworthy feature of the case was the unusual rapidity with which the slough separated, leaving a clean granulating surface. In Case 2 again the treatment seemed to influence the course of the disease favourably. This favourable experience was not repeated however in the other three cases. Case 3 can hardly be considered, since it was certain that a man of the type of this patient with a huge carbuncle and uncontrolled diabetes would die.

Cases 4 and 5 appeared to be unaffected by the serum.

There remain the cases of staphylococcal septicæmia and pyæmia. Of these the most striking is Case 8. This boy had a staphylococcal septicæmia obviously due to osteomyelitis, but the site of the osteomyelitis could not be found. He was profoundly ill for many days, and if any further proof of the severity of the infection is needed it is given by the extent of the bone lesions as shown by later radiograms (Figs. 1 and 2). The injection of the serum was the turning point in his recovery, and the improvement was shown by a great change in the general condition. The temperature and pulse-rate did not alter very greatly, and in fact in none of the cases has there been a dramatic and immediate fall in the temperature and pulse-rate. Of the other four cases, two had positive blood cultures, and the other two cases developed several pyæmic abscesses before serum treatment was given. In all cases the serum produced a change for the better in the general condition, and in all cases a further development of metastatic abscesses ceased.

We were definitely of the opinion that the serum therapy prevented death in some cases, and shortened the course of the disease in all.

In conclusion it may be stated that the serum is a valuable method of treatment in severe staphylococcal infections such as septicæmia and pyæmia. The results are much less definite when the lesion is localised as in carbuncle. The serum has, however, not been tried in any case of carbuncle with severe constitutional disturbance with the exception of Case 3, in which the uncontrolled diabetes and the type of patient prejudiced the result.

Before coming to a definite conclusion further experience of the treatment in such cases is necessary.

Our thanks are due to Dr. M. H. Jupe for permission to publish the radiograms, and to Mr. Alan Perry for the notes of one case.

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TICK-BITE FEVER IN SOUTHERN AFRICA.

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IN 1911 both Nuttall [1] and Sant'Anna [2] gave a short description of what they had recognised as a new specific fever occurring in Southern Africa and conveyed by the bite of a tick. Sant'Anna had seen the disease at Lorenzo Marques, and Nuttall had collected written information from Dr. E. Turner, Mr. Howard, and Dr. Hindle, who had all had experience of the disease. Nuttall proposed the name of "tick-bite fever." As this name has priority, and is fully descriptive, we think it should stand.

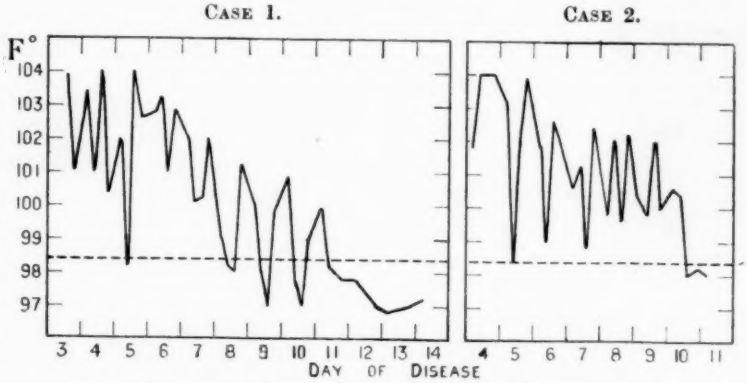
Tick-bite fever is a mild disease. It has no mortality, no sequelæ, almost no complications, and practically no literature. It occurs in the southern half of Africa; there are localities like Lorenzo Marques where no newcomer escapes it (Prates [3]). It leaves a solid immunity. It is not contagious. It is often confused with typhoid, paratyphoid, measles, and even with tick fever, and perhaps with typhus. Its mildness, well known to the inhabitants of affected areas, has led to its neglect by scientists and patients alike. Yet it is a well-defined clinical

and pathological entity, which derives its importance from the fact that it is the mildest of, but certainly belongs to, the group of typhus-like diseases now being studied all over the world.[4] (1) It is clinically similar to typhus. (2) The patient's blood-serum agglutinates the proteus strains X19, X2, and X Kingsbury (Pijper and Dau [5]). (3) The patient's blood, injected into guinea-pigs, produces a fever, which resembles that caused by typhus blood. The fever can be transmitted to further guinea-pigs, as in typhus.[6] (4) The brain of such guinea-pigs may show nodules with rickettsia-like bodies,[7] and their blood-serum agglutinates the proteus strain X Kingsbury.[5]

It will be shown here that tick-bite fever and typhus are similar, but not identical, on clinical, pathological, and serological grounds.

CLINICAL PICTURE.

The bite-mark of tick-bite fever is the most characteristic symptom. Patients practically always dislodge the tick during the incubation period. When first seen, the bite-mark has usually become a red papule with a discoloured centre. The centre later becomes necrotic and black, and eventually drops out. There is no pus. This whole process takes about three weeks. The diameter of the lesion is one or two centimetres.



Temperature charts in two cases, showing curves resembling those of typhus.

From the beginning, the regional lymph-glands become swollen and painful, and there may be a lymphangitis, but the glands never suppurate, and the swelling disappears as the bite-mark heals. The bite-mark may occur anywhere on the body, and has to be sought, as in contrast with the glands it is hardly at all painful. The glands often prove a useful guide to the bite-mark. By no means every tick-bite causes infection. Patients may have more than one bite-mark. A typical bite-mark is pathognomonic. Only larval ticks convey the disease. This was stated by Sant'Anna [2] and by Turner, Howard, and Hindle, as quoted by Nuttall.[1] Our experience, together with that of other local observers, confirms this. Prates [3] is of the same opinion. In most cases the tick is *Amblyomma hebræum*, but sometimes it is a rhipicephalus. The incubation period is eight to nine days.

Round Pretoria most cases occur during the summer; in the hotter regions there seems to be no seasonal influence. The ticks live in the grass, but may travel long distances on human beings or their belongings. This leads to infection at a distance from infected localities, and often to the false incrimination of ticks from domestic animals. There is no correlation between type of disease and locality. We see numerous cases every year that have become infected within a few miles of Pretoria, but also cases that owe their infection to a stay in the Northern Transvaal or in Portuguese East Africa.

The disease shows two forms. One is the very mild form, with a bite-mark and painful swollen glands, but no general symptoms except slight fever. The other, and more frequent, form shows bite-mark, swollen glands, headache, rash, continuous fever for ten days, and eventually hallucinations, delirium, photophobia, and toxæmia. Pains in the limbs, back, and neck are present in varying degrees. The spleen is usually not palpably enlarged.

There is no typical rash. Spots appear on the fifth day, and may be macular or papular, in small rose spots or blotchy, diffuse or discrete, raised or level with the skin, bright red or dark red, confined to the trunk or all over the body, including palms and soles. A bright red papular rash all over the body is perhaps the most common form. The patient does not just have one crop; fresh papules may arise every day until the end of the fever. They do not itch, but give a feeling of local discomfort. The rash disappears during convalescence, and leaves nothing behind.

The fever curve resembles that of typhus. The Figure illustrates this, but the curves here are not quite typical, the big drops in the beginning of the curve being due to aspirin. The pulse is fast, but not so fast as the temperature would lead one to expect. In the worst cases the heart may become somewhat irregular.

The headache is the patient's chief complaint, and is often very severe during the height of the fever. Swelling of distant glands has been reported; we believe that this is usually due to additional bites. Swollen glands in the neck may give rise to a misleading local stiffness. The after-effects of the illness are nil, apart from some lassitude, which soon passes off.

To the inexperienced, the disease has suggested the necessity of a differential diagnosis between plague, typhoid, paratyphoid, measles, meningitis, and typhus. Experience of the disease leads to search for the bite-mark, via the swollen lymph-glands, and questioning as to days spent in the open country the week before. Laboratory tests so far are only of value in the latter stages of the disease.

Treatment is purely symptomatic, salvarsan and its substitutes having been found of value by some.

PATHOLOGY.

We have made numerous blood cultures, which all remained sterile. Direct dark-field examination of blood only showed numerous pseudo-spirillæ of fibrin. Examinations of blood-smears revealed nothing. The white count is of interest. Our counts are tabulated in Table I. There is a relative lymphocytosis, in sharp contrast with the case of real typhus which we have included in the table, and in which we found the usual features. We have never found the total number of white cells increased. There is also "Linksverschiebung," which gradually disappears to make room

for a normal count, as instanced by patient "N," whose blood was examined five times. Prates,[3] at Lorenzo Marques, also found a relative lymphocytosis.

TABLE I.—*White Cell Count in Tick-bite Fever and in Typhus.*

—	Day of disease.	Neutrophiles.	Eosinophiles.	Basophiles.	Lymphocytes.	Monocytes.	Reizzellen.	Subdivision of neutrophiles in percentages.		
								Nucleus round.	Nucleus rod-shaped.	Nucleus segmented.
1	1	63	—	—	33	4	—	—	32	68
2	1	53	2	—	36	9	—	4	30	66
3	2	66	—	—	28	6	—	4	54	42
4	2	61	—	—	32	6	1	2	50	48
5	3	72	—	—	27	1	—	2	50	48
6	4	59	—	—	30	11	—	3	43	54
7	4	61	—	—	35	4	—	2	44	54
8	5	53	2	—	33	10	2	4	48	48
9	11	55	—	1	37	7	—	2	50	48
10	31	52	—	—	40	8	—	1	24	75
11	200	70	2	—	23	5	—	—	12	88
12	5	59	—	—	29	9	3	2	36	62
13	5	54	—	—	40	6	—	8	48	44
14	6	50	2	—	39	9	—	4	41	55
15	7	52	1	—	41	4	2	2	44	54
16	8	66	1	—	27	6	—	4	45	51
17	10	56	—	—	37	5	2	4	56	40
18	14	56	1	2	39	2	—	—	16	84
19	?	48	—	—	50	2	—	4	48	48
20	?	51	—	1	38	10	—	2	52	46
Typhus	10	80	—	—	18	2	—	6	56	38

SEROLOGY.

It is well known that typhus agglutinates live suspensions of *Bacillus proteus* X19 of Weil and Felix.[8] Poland typhus in addition agglutinates X2 (Felix [9]), American typhus does not.[10 9] Neither of them agglutinates X Kingsbury. The "shop-typhus" of Fletcher and his co-workers [11] agglutinated X19 and not X Kingsbury; their "scrub-typhus" did the reverse. All this shows that the various X strains of *B. proteus* have been used, and should be more universally used, for the differentiation of typhus-like diseases.

A full record of agglutination results and technique in tick-bite fever appears elsewhere.[5] Typical examples of such tests are here given in Table II. We have added two cases of typhus for comparison.

TABLE II.—*Agglutination Reactions in Tick-bite Fever and Typhus.*

Case.	Day of disease.	OX19	OX2	X Kingsbury.
Tick-bite fever				
1	4th	—	—	+
1	11th	+(+)	++	+
1	35th	++	+(+)	+(+)
2	3rd	—	—	+
2	9th	+(+)	++(+)	+
3	5th	—	—	++
3	60th	++	+	++(+)
Typhus				
1	10th	+++	+++	—
1	15th	+++	+++	—
2	14th	+++	+++	—

All serums diluted 1 : 100. +++ complete agglutination with complete sedimentation. — complete negative.

Table II. shows that South African typhus agglutinates the proteus strains X19 and X2 quite strongly, and that tick-bite fever agglutinates all three strains. In tick-bite fever the titre evidently goes up as the disease progresses, and reaches its highest value many days after the patient is quite better. A high titre is never reached, but the agglutinins persist in the blood for a very long time. We have done a large number of negative controls.

Low titres against all three available proteus strains have also been found in Rocky Mountain spotted fever, another typhus-like disease conveyed by a tick.[10] Of other typhus-like diseases it is known [9] that tsutsugamushi and the "fièvre exanthématique" of Marseilles also show low agglutination titres.

DISCUSSION.

Our evidence shows that tick-bite fever is a typhus-like disease which can be differentiated from typhus on clinical, pathological, and serological grounds. Amongst workers in Southern Africa there is no general agreement on this matter. In Kenya, Clearkin [12] described 12 cases of an illness which he calls a "typhus-like disease," and which is rather similar to what we have called tick-bite fever. But Clearkin mentions ulcers that might be the results of tick-bites in two of his cases only, and is not inclined to attach importance to these bites. He found weakly-positive results with X19, no other strains being available at the time. Anderson [13] reported similar findings, also from Kenya, and concluded that the disease was typhus. Clearkin,[14] in a later communication, has arrived at the same conclusion. Jewell and Cormack [15] also regarded the Kenya disease as typhus, although they stated that there is usually an angry-looking mark, with swollen glands, but they think tick-bites an improbable causation as, according to them, tick-bites are so common. Lately, Dr. Hopkirk, of Nairobi, has informed me that he in his cases has always found the "initial tick-bite." It seems likely that the Kenya disease is largely tick-bite fever, with perhaps an admixture of real typhus. Agglutination reactions with all three available proteus strains might settle the question.

The issue is complicated by the fact that typhus in Southern Africa seems to be a much milder disease than it is elsewhere, and only gives weak agglutination results with X19, the only strain that has been used as a routine measure. Attention has repeatedly been called to this weak agglutination by the South African Institute for Medical Research in its annual reports, and also by Pirie.[16] The clinical mildness of South African typhus is illustrated by the official figures of Natal, where during the last five years 126 European cases of typhus were notified, with only one death. Tick-bite fever occurs in Natal, but is not notifiable. If it were, would that perhaps bring down the incidence of typhus?

This tick-bite fever and typhus problem is not new in South Africa. The literature constantly contains references to an outbreak of typhus-like disease near Pretoria, described by McNaught.[17] McNaught, on purely clinical grounds, believed that it was "Brill's disease," but, curiously enough, he also states that Maher had seen cases similar to his own in another South African town, and had found tick-bites in these cases. The real nature of this outbreak will, of course, never be cleared up.

At the present time, however, with improved methods of investigation, the road towards differentiation and progress in knowledge seems clear. Typhus in Southern Africa may be of a mild type and give weak agglutination results, but we have shown that there are means of differentiation between typhus and tick-bite fever.

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(*Continued at foot of next page.*)

CLINICAL AND LABORATORY NOTES

CONTACT INFECTION IN ACUTE POLIOMYELITIS

WITH SHORT INCUBATION PERIOD.

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THE following two cases of acute poliomyelitis in which infection appears to have been acquired through direct contact present several features of interest.

CASE 1.—A. B., female, aged 19 years and 9 months, clerical officer in a Government office, gave no history of any serious illness. She spent the first week of July, 1931, on holiday at Felixstowe with her friend, C. D. For the third week in July she went to Folkestone with another friend. On August 7th she was admitted to a ward in a general hospital in London in order to have two exostoses on the back of the os calcis removed. The operation was duly performed, and A. B. was making a good recovery, when on August 18th she had a febrile attack (temp. 99° F.) and complained of stiffness of the neck. The illness was regarded as a mild attack of influenza. It is interesting to note that the ward occupied by A. B. is mainly an ear, nose, and throat ward, and that several of the patients suffered from sore-throat and tonsillitis at the time. One of these cases may have been a carrier of poliomyelitis. A. B.'s rise of temperature soon subsided, and she then complained of pain in the left shoulder and inability to raise her arm to do her hair. This was regarded as neuritis, and she received some diathermy. On Sept. 22nd she was discharged from the hospital, and returned to duty at the office for one day on Sept. 24th.

In the meantime, A. B.'s friend, C. D., had been diagnosed by Dr. R. T. Bailey as suffering from acute poliomyelitis. A. B., who still felt weakness in her left arm, now consulted Dr. Bailey, who diagnosed poliomyelitis in her case also, and referred her to Dr. C. P. Symonds. Dr. Symonds saw A. B. on Sept. 29th at his out-patient clinic at Guy's Hospital. She then had flattening of the left deltoid, flaccid weakness of the left shoulder-girdle, and paralysis of the spinati. She also showed weakness of the left quadriceps muscle and of the flexor muscles of the left knee. It was evident that A. B. was suffering from the effects of a recent attack of acute poliomyelitis.

CASE 2.—C. D., female, aged 19 years 9 months, clerical officer in the same Government office as A. B. No history of any serious illness. As already mentioned, C. D. spent the first week of July, 1931, with her friend A. B. at Felixstowe; from August 15th to 23rd she was at a girl guides' camp in Sussex. On inquiry all girls at this camp appear to have had a clean bill of health. On August 30th C. D., accompanied by her mother, visited A. B. in her ward at the hospital and kissed her twice. The interview lasted about ten minutes. On Sept. 1st C. D. had a headache and a high temperature (102° F.), and was confined to bed. On Sept. 3rd and 4th she complained of pains at the back of the neck and in her head; her throat was inflamed and septic. Her temperature continued to be elevated in the evening, and on Sept. 5th she lost the use of her right arm. By the 10th the patient's temperature was normal. On Sept. 29th C. D., by Dr. Bailey's advice, attended Dr. Symond's out-patient clinic at Guy's Hospital. Dr. Symonds confirmed Dr. Bailey's diagnosis of acute poliomyelitis, and found paralysis of the muscles of the left shoulder present, the deltoid being especially affected.

The chief points of interest concerning these two cases are as follows. (1) Acute poliomyelitis has occurred through contact infection in two young adult females of identical age. (2) The resulting paralysis in both cases was of very similar distribution, affecting principally the left shoulder muscles. (3) A. B. contracted poliomyelitis in a hospital ward while undergoing treatment for a surgical condition. The probable source of her infection was an undetected carrier, also an in-patient in the ward. (4) The non-recognition of the true nature of A. B.'s illness while in hospital illustrates how liable poliomyelitis in the acute febrile stage is to escape detection. (5) The contraction of poliomyelitis by the second patient through kissing the first patient appears to be a clear case of contact infection. The incubation period (two days) was short, but falls within the range of two to ten days given by Wickman, Flexner, and others. The first patient was still infectious on the twelfth day of her disease.

My thanks are due to Dr. C. P. Symonds and to Dr. R. T. Bailey for much information and assistance in tracing the epidemiology of these two cases.

(*Continued from previous page.*)

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PYELITIS IN NEWLY BORN INFANTS.

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THE recognition of pyelitis in childhood is commonplace, but in very early infancy the clinical picture and the diagnosis may be obscure. Pyelitis is probably present in the first few weeks of life more commonly than is generally supposed. Because of their age I consider that the following two cases may be of interest.

FIG. 1 (Case 1).

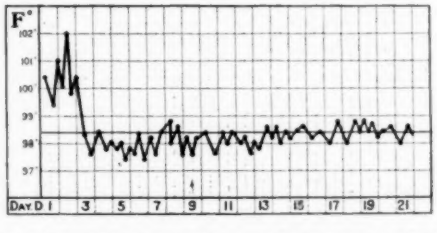


Chart showing temperature variations from the first to the twenty-first day of illness.

CASE 1, a male infant, was first seen when aged 1 month. The birth-weight was 7 lb., and the weight at 1 month was 6 lb. 11 oz.; the infant was breast-fed. Three days previously, when 4 weeks old, he had been circumcised, and on the following day was noticed to be feverish. The urine contained both pus and *B. coli*. The child was put on alkalis, and the temperature rapidly settled to normal, and the infant gained weight. At the end of six weeks the urine was quite normal, and at 5½ months the infant weighed 16 lb.

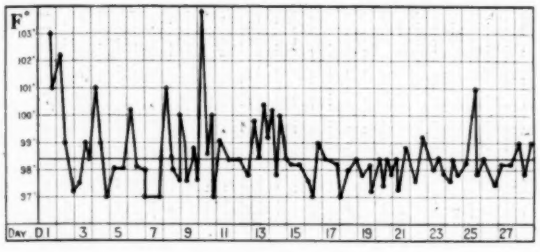
CASE 2, a male infant, was seen when aged 1 month. The birth-weight was 8 lb., and the child was artificially fed throughout. He was circumcised when a fortnight old, and seemed to do quite well for a few days. Ten days after

the circumcision he had a rigor, and his temperature rose to 105° F. An examination of the urine showed much pus, and *B. coli* were present. Alkalis were given, and the temperature gradually subsided, but there was a marked tendency for it to swing for some days. The urine became quite clear in four weeks. The child gained weight rapidly, and when 1 year old weighed 23¼ lb.

PREVIOUS CASES REPORTED.

In the large series of cases reported by Poulsen,[1] Ramsay,[2] and Chown,[3] no infant under the age of 1 month is mentioned. Kretschmer [4] reports pyelitis in one male infant, aged 27 days, in a series of 86 cases. Von Reuss [5] refers to a paper by Kovalewsky

FIG. 2.



Temperature chart in Case 2.

and Moro, who reported an infant, aged 8 days, with a typical pyelitis; it died on the eleventh day.

Under the title, Congenitally Acquired Pyelitis, Conrad [6] reports three cases in female infants. In two of them convulsions were present and a high fever from birth, pus, albumin, and *B. coli* being present in the urine. These all disappeared on alkaline treatment. In each case the illness commenced from birth, and—since the mother of one infant had had pyelitis—Conrad raises the question whether the infection was not, in fact, acquired during intra-uterine life.

A very interesting paper by Sauer [7] on neonatal pyelitis describes the symptoms present in such cases. He claims that the disease is more frequent in the male than in the female, and that vomiting and diarrhœa are common. In a series of 15 non-thriving new-born infants, with gastro-intestinal symptoms, *B. coli* and pus were found in the urine of 14. Graham [8] reports six cases of pyelitis in newly born infants. The urines were heavily infected by the second or third day. Wilson and Schloss [9] describe three male and two female infants under the age of 1 month with typical *B. coli* pyelitis.

In all, some 30 newly born infants have been reported as suffering from pyelitis, the findings being the presence of pus and *B. coli*, with general constitutional disturbance. When presented with the two cases described above, I felt very uncertain about the ultimate prognosis, especially as they were males. The possibility of some congenital malformation of the urinary tract was seriously considered. The progress that both infants have made, and the fact that the urine cleared up, suggests that the urinary tract in these two cases is normal. One is accustomed to associate pyelitis most commonly with females, but published records suggest that it is as common in males as in females in the neonatal period. Whether or not circumcision had anything to do with the onset of the pyelitis it is impossible to decide. In one case the disease appeared to follow immediately on the operation, but in the second there was an interval of ten days. It must be pointed out, however, that in Case 1, where the symptoms appeared to follow immediately after the operation, the child weighed less at one month than when born. This suggests the possibility that the pyelitis had been present, undiagnosed, for some days previously. In neither case were gastro-intestinal symptoms prominent. Restlessness, pallor, and rigors attracted the attention of the maternity nurse in both cases, and prompted the collecting of a specimen of urine.

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THE PHOTO-ACTIVE FUNCTION OF CHOLESTEROL IN SKIN CANCER.

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THE skin is the most frequent site of cancer in the cases attending my institute, and of every 100 patients suffering from cancer of the skin, 98 have developed it on the face. The commonest site is the nose—61·4 per cent.; then come the cheek, 18 per cent.; the ear, 7·9 per cent.; the forehead, 7·7 per cent.; and the temporal region, 4 per cent. These figures suggested to me a relation between environmental factors and the development of the tumours. The most likely exciting cause of tumours of the face, particularly of the nose, is obviously the sun, to which this part of the skin is exposed. I have therefore undertaken investigations into the cholesterol content of the skin in various areas, basing my work on a theory I have long held: that the soil in which a neoplasm appears is powerfully influenced by the lipoids. I have found a very considerable difference of cholesterol content between the skin of the face and that of the abdomen [1] in the same person; in some cases there was five or seven times as much cholesterol in the face. Further investigations showed marked differences between the covered and uncovered parts of the face itself; the nose contained over 73 per cent. more than the forehead.

These results seemed sufficient to indicate a heliotropism of cholesterol. I therefore irradiated the skin of the back of rats with sunlight and with ultra-violet rays, keeping an excised portion of skin from the same level as a control. An increase of cholesterol was found in the irradiated skin.

Two coincident sets of facts are involved: on the one hand the influence of cholesterol in the development of tumours—an increase of cholesterol in precancerous regions, an increase of cholesterol in tumours themselves, hypercholesterolæmia in precancerous conditions, and the frequency of skin cancer in areas rich in cholesterol; on the other hand, the heliotropic quality of cholesterol, a phenomenon which I connect with its photo-activity, shown by the photographic plate.

My experiments in the latter connexion [2] show that

[1] Roffo, A. H.: Bull. Inst. Med. Exp., 1929, xxii., 370; Roffo and Pilar, Fr.: Ibid., 1930, xxiii., 22.
[2] Roffo: Ibid., 1930, xxiv., 555.

cholesterol becomes photo-active under the influence of sunlight, X rays, ultra-violet light, and radium, and retains this property for nine to ten days after exposure. The period varies with the intensity of the irradiation. The activity shows itself in an emanation, which must be associated with oxidation, for the process is only seen in the presence of air, oxygen, or ozone, and does not occur in a vacuum or in an atmosphere of hydrogen or nitrogen. On the other hand, this photo-activity of irradiated cholesterol cannot be attributed to any action of the surrounding atmosphere. It was shown by experiment that if two specimens of equal cholesterol content were irradiated and the atmosphere was then exhausted from one, the specimens nevertheless produced equal markings on a sensitive plate. Again, oxygen is clearly necessary to the production of the phenomenon. If cholesterol is enclosed in crystal or uviol tubes, and a vacuum produced in one while others are filled with air, oxygen, ozone, hydrogen, or nitrogen, and all are submitted to ultra-violet light, then a photographic plate will only be marked by the cholesterol in a tube containing air, oxygen, or ozone.

It is known that the rays of the sun not only increase organic oxidation, but also accelerate cell metabolism generally, increasing cell osmosis. The effect would therefore be to increase the dynamism of the cells coincidently with the increase in the photo-dynamic function. If, in accordance with the investigations of Hamburger, sunlight is regarded as a fixator of calcium in the organism, then, according to my results, it may also be regarded as a fixator of cholesterol, which thus becomes not only a photo-dynamic substance, but also an organic accumulator of light. This may explain the great rarity of cutaneous cancer in negroes, in whom pigmentation prevents absorption of the luminous rays and photo-toxic phenomena; this fact may be related to a homogeneous distribution of cholesterol in their skins.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

SECTION OF THERAPEUTICS.

AT a meeting of this section held on Nov. 10th, with Dr. E. P. POULTON, the President, in the chair, a paper on

Some Aspects of Ketosis

was read by Prof. E. C. DODDS. He discussed three methods of measuring acidosis: by the alveolar carbon dioxide tension, the alkali reserve, and the ammonia coefficient. (1) The estimation of the alveolar carbon dioxide tension was, he said, unsatisfactory from the clinician's point of view, as the tensimeter, if used, was liable to fall out of working order and the analysis of a specimen by the Haldane apparatus was beyond the capacity of the ordinary laboratory assistant; the automatic apparatus made by the Cambridge Instrument Company took too long to work. (2) The alkali reserve was estimated either by the manometric or by van Slyke's old method; the former was more accurate than was necessary, the latter gave variable results unless certain precautions were taken. Prof. Dodds suggested that the apparatus should be shaken mechanically for a standard time, and that 5 per cent. carbon dioxide in air should be used instead of alveolar air to blow through the serum. (3) The estimation of the ammonia coefficient of urine was not useful to the clinician. Ketones when present in the blood could be estimated and were classified into volatile (aceto-acetic acid) and non-volatile substances (β hydroxybutyric and other acids).

All previous work on the pH of blood would, he said, have to be reconsidered in the light of recent proof, brought forward by Kerridge and collaborators, that an acid change occurs in blood soon after the sample has been taken. Possibly there was no significant change of pH in the blood except in extreme conditions. From the clinician's point of view acidosis could be defined as a depletion of the alkali reserve measured by any of these methods. It may be caused by loss of total base from the blood or by excessive production of acid. It cannot be the cause of diabetic coma, since the same depletion of alkali reserve may be brought about in a man without the occurrence of coma.

CAUSE OF DIABETIC COMA.

Ketosis, Prof. Dodds continued, could be defined as any condition in which acetone and β hydroxybutyric acid are present in the blood and urine in excess of the normal trace. The likelihood of coma in diabetes is greater, the greater the degree of ketosis. Trevan, working on animals, has shown that the injection of certain ketones, some enolic compounds, gave the deepened respiratory movements characteristic of diabetic coma, while acetone and β hydroxybutyric acid did not. Cases of diabetic coma without acetone in the urine have been reported in America. The lowering of the alkali reserve in diabetics could not be accounted for mathematically by the amount of aceto-acetic and β hydroxybutyric acids present in the blood, and he had found that the concentration of these acids increased for a few hours after a patient had come out of coma. There was, therefore, this discrepancy in our knowledge, that acetone bodies would cause signs of coma in the animal, but that in the human their concentration does not correspond to the degree of coma.

In conclusion, Prof. Dodds raised the question whether alkalis should be given in the treatment of diabetic coma. The majority of cases did not require alkali and could be restored by glucose and insulin, but now and then patients with low alkali reserves died, and he questioned as to whether they might possibly have recovered if given alkali.

DISCUSSION.

Dr. E. P. POULTON said he had found the tensimeter satisfactory for the clinical estimation of alveolar carbon dioxide. He considered that, as controls had been taken, the value of the early work on the pH of the blood had not been upset by the recent discovery of an "acid change." He had found no great difference in the pH of venous and arterial blood. He had seen one case of diabetic coma without acetone in the urine, but there was suppression of urine and acetone was found in the cerebro-spinal fluid. Possibly the suppression of urine might account for the deaths of the cases mentioned by Prof. Dodds. Inthe treatment of diabetic coma normal saline should be given by the mouth through a duodenal tube rather than by intravenous injection. Occasionally the patient vomited, but usually quantities of saline

could be given, so much that œdema could result and the lungs needed to be watched.

Dr. A. M. COOK had determined the pH of blood by taking the sample into an ice-cold syringe and then allowing it to warm up in the glass electrode chamber. In this way he had found that the "acid change" took place at a certain temperature. He had therefore made his estimations at a lower temperature. He showed the record of a case of pyloric obstruction which had been investigated in this way, where the pH of the blood had been altered considerably by the administration of ammonium chloride and sodium bicarbonate. Ketosis, he said, should not be confused with acidosis, since it could also occur with alkalosis, as, for instance, after acid loss from vomiting. Similarly acetone bodies in the urine did not imply acidosis, not even when the urine was acid, for occasionally cases of alkalosis with acid urine were seen. He considered that sodium bicarbonate might be justifiable in the treatment of a very few cases of diabetic coma, more especially where there was a high preponderance of the non-volatile acids, but even in these cases there was considerable danger of changing the case from one of acidosis to one of alkalosis.

Dr. L. FINDLAY said that acetone in the urine meant not acidosis but malcombustion of fat; acidosis was only recognised by estimating the alkali reserve. Certainly a non-diabetic patient could reach the degree of acidosis of one in diabetic coma without having any of those symptoms. Acidosis caused by the administration of sodium salicylate, ammonium chloride, or sodium phosphate similarly did not lead to coma, nor was it cured by glucose. Presumably damaged and undamaged tissues differ in their ability to deal with abnormal conditions.

Dr. M. W. GOLDBLATT stated that vomiting might cause alkalosis for he had seen cases of uræmia showing alkalosis after vomiting, although they were previously acidosed. He considered that sodium bicarbonate should not be given for diabetic coma, because he found it interfered with the action of insulin and also contrary to other people's experience with the deposition of glycogen in the liver. He mentioned Hurtley's work, showing that those cases of diabetes which are progressing rapidly towards coma exhibit a reversal in the proportion of aceto-acetic acid to β hydroxybutyric acid, aceto-acetic acid being then in preponderance. While fasting Dr. Goldblatt had taken 7 g. of the salts of aceto-acetic and β hydroxybutyric acids alternately for several days, and although ketones had been present in large quantities in his blood he had had no symptoms of incipient coma. Although this might be explained by saying that undamaged tissues could withstand the ketosis, there appeared to be some unknown factor in the causation of diabetic coma.

Dr. J. TREVAN remarked that for a given concentration of acetone bodies in the blood their concentration in the tissues where they are being produced is greater during coma than in healthy individuals when the acetone bodies are being broken up. He thought that diabetic coma was due to the toxic action of the anion. He considered that the word acidosis should be reserved for the rare cases of true poisoning by acid, accompanied by an increase of the pH of the blood. The only way of estimating the alkali reserve was to give sodium bicarbonate and to determine how much was required to render the urine alkaline.

Prof. A. W. M. ELLIS, without claiming dehydration to be the cause of diabetic coma, assigned a large part to it. The desiccation of the fæces seen at the post-mortem of a case of diabetic coma was impressively demonstrative of dehydration. One factor in its causation was the upset of the balance of water with electrolytes. He found it was easy to give excess of fluid to these cases; now and again œdema occurred which persisted for a week or ten days after recovery from coma, without renal or cardiac lesions.

Dr. R. D. LAWRENCE recalled three cases of diabetic coma which he had seen in which ketones were present in the blood and could not be detected in the urine. By injection of ketones into dogs he had been able to produce no symptom referable to diabetic coma, but the animals had all died. He felt that there was some factor in the cause of coma which is still unknown.

SECTION OF RADIOLOGY.

AT the first meeting of this new section, held on Nov. 20th, the chair was taken by Prof. J. M. WOODBURN MORRISON, the President, and Dr. STANLEY MELVILLE opened a discussion on

X Ray Diagnosis of Diseases of the Chest.

He began by attacking two heresies—viz., "hilum tuberculosis" and "peribronchial phthisis." He stressed the clinical aspect of radiology and the need for team-work, at the same time emphasising the value and accuracy of radiography—the eye of clinical medicine. Definite infiltration could be shown on the film as soon as there was any clinical evidence of phthisis. When physical signs were present the initial stage was passed and the film would show far more evidence of disease than physical examination. The great majority of lung infections arose by inhalation and most cases in the adult were cases of reinfection. At the basis of all misconceptions, he thought, was the action and reaction of the lymphatic system. The infant either got a rapid fatal caseating broncho-pneumonia, or else a localised inflammation in the lung giving little clinical evidence of its presence and apt to clear up. The tracheo-bronchial glands might calcify, or might remain caseating and become the principal factor, opening into a bronchus, a blood-vessel or a lymphatic; if into a bronchus the result was broncho-pneumonia again; if into a blood-vessel, acute miliary tuberculosis. Or the parenchyma might be involved, spreading outwards into the hilum; the inflammation being perifocal, just as might be seen around an inflamed cervical gland. This form had received many names; the appearances might be evanescent or persistent and the symptoms slight or absent, but the infant reacted to tuberculin. It was not right, however, to call such a child tuberculous. The reaction was evidence of infection only.

"Peribronchial phthisis," Sir Kingston Fowler had said, "is very prevalent in America and unknown in France." English workers were, however, responsible for this heresy, having been overwhelmed by mass-shadows. A simple chronic bronchitis might cause thickening of the bronchial walls with increase in linear striation and enlargement of the hilar lymphatics. If there were some ulceration the sputum would be streaked, giving the picture so often called peri-bronchial fibrosis.

Abscess of the lung was due to inhalation of a foreign body or embolism, or might follow pneumonia, or perforation, or breaking-down of lung tissue. It gave a characteristic picture with a clear centre and dense surround, and lung tissue in the neighbourhood. In carcinoma lipiodol showed a rat-tailed

stenosis which was rather characteristic. Non-malignant growths would just as surely kill—in time, by pressure—as malignant ones. They were all extrapulmonary and pushed the lung in front of them as they grew. Fibromata were the commonest, and grew almost invariably from the posterior thoracic wall. They might be large before causing symptoms and appeared as a well-defined homogeneous, rounded opacity. Dermoid cysts grew from the second or third branchial clefts or thymic remains and were thus anterior. They were more irritant than fibromata, often irregular in shape and adherent to the lung tissue. Diagnosis was easy in a lateral radiogram, in which the growth was seen to arise in the anterior part of the thorax. Early diagnosis was of the utmost importance.

Dr. PETER KERLEY spoke on

MALIGNANT CONDITIONS.

The great difficulty, he said, was to find a classification. He adopted a simple radiological grouping: root growths and lobe growths. The lobar or pneumonic form showed different appearances according to the lobe affected. The fissures were altered in position by contraction of the lobe. In the hilar form the opacity was densest near the root; often a second, less dense opacity due to collapse covered the whole lobe. Carcinoma could be diagnosed with certainty if the vascular markings were visible in the hilar shadow and invisible in the peripheral area. Carcinoma was the commonest cause of bronchial stenosis in Europe. Diaphragmatic paralysis was a most valuable sign. The right phrenic ran through a group of hilar glands while the left ran clear; hence the frequency of right phrenic paralysis. The paratracheal and bifurcation glands affected the vagus, disturbing the cardiac rhythm and causing abdominal symptoms, often gastric crises like those of tabes, which completely overshadowed the lung symptoms. Very rarely a lung cancer directly compressed the œsophagus and caused vomiting. Pleural effusion was the bugbear of the radiologist, for it masked nearly everything. Carcinoma involving the pleura caused such great thickening that it was impossible to tell it from underlying lung involvement.

The weakest point in the mediastinum was at the level of the third dorsal vertebra, and here displacements were seen. In fibrosis the œsophagus and trachea were always displaced and rotated. In collapse the trachea as a whole swayed slightly to the diseased side. Effusion soon depressed an atonic diaphragm, which pushed the liver down, often leading to a diagnosis of liver metastasis. The lung lymphatics were important to every radiologist. If the paratracheal group were easily visible the primary growth was probably extrapulmonary. Tuberculous pneumonia, syphilis, and aneurysm might simulate carcinoma, but were distinguished by the fibrosis of tuberculosis and by taking a film with a Potter Bucky diaphragm and a harder tube to show aneurysm. Secondary infection of carcinoma was frequent, but did not obscure the neoplasm. Occasionally the signs of abscess might obscure those of growth. A fluid level in the centre of a collapsed area was diagnostic. In the absence of enlarged glands or phrenic paralysis, diagnosis of malignant abscess rested on its asymmetrical position in relation to the area of consolidation and its connexion to the mediastinum.

Hilar carcinoma showed as a dense opacity round the root without collapse. It was easier to diagnose, but might rapidly be converted into the pneumonic form. Abscess formation was very frequent, but pleurisy was a late complication. Abscess did not obscure the diagnosis, as it remained the same size while the growth increased. A lobe might collapse and then this type could not be distinguished from the pneumonic type without a Potter Bucky diaphragm. Obstruction of the vena cava was commoner in this type. Lymphadenoma and syphilis were the only conditions resembling it. Lymphadenomatous or lymphosarcomatous glands responded to a test dose of X rays. Syphilis was always associated with gross interstitial emphysema. Secondary deposits might be confused with a form of pulmonary tuberculosis associated with diabetes; in this, however, a cavity might be seen and most of the nodes were in the upper part of the lung.

DISCUSSION.

Dr. F. G. CHANDLER disagreed with Dr. Melville on one point only: he did not think radiography the best method of early diagnosis of tuberculosis, for shadows did not always appear before symptoms, or before bacilli could be found in the sputum or fæces. He agreed with Dr. Kerley that malignant pulmonary disease was apparently on the increase, an increase due mainly to improved methods of diagnosis. In the past it had often been mis-diagnosed. The difficulty of diagnosis when pleural fluid was present might be overcome by replacing the fluid with air or oxygen. Negative findings were of as much value as positive signs. An area with no air-entry and a negative radiogram strongly suggested growth. Routine examination would often show masses of growth which had caused no physical signs. No abdominal operation for malignant growth was justified to-day without radiography of the chest.

The PRESIDENT mentioned Dr. Dunlop's analysis of cancer in relation to the ageing of the population, which showed that there was no absolute increase in cancer except of the breast.

Dr. MAURICE DAVIDSON deplored the lack of a recognised standard of normality, and wished he could see a series of chest X rays from healthy people of various ages in various occupations. He stressed the insufficient amount of correlation between the clinician and the radiologist. The term "lung abscess" still included a number of differing conditions and led to confusion. It might still be diagnosed both clinically and radiologically in patients in whom it was merely the secondary expression of some underlying condition. He showed a series of slides of interesting cases of lung carcinoma, and produced figures illustrating the increase of this condition—which he believed to be a real increase.

Dr. R. E. ROBERTS described some typical cases presenting difficulty in diagnosis to the radiologist. He thought that radiograms gave the earliest diagnosis of phthisis but left much to be desired in malignant disease. Silicosis with tuberculosis might be very difficult to tell from silicosis with malignant disease. Extensive mottling might cause confusion between miliary tuberculosis and carcinomatosis. Despite many difficulties, however, radiology gave more information than other methods. There was great need for collaboration.

Mr. J. B. HUNTER said that radiology could give great help in the decision whether or not a phrenic avulsion should be done; this operation should be performed if the diaphragm were in spasm. It was surprising what a shrunken lung might be found round a tumour; often the X ray gave no idea of the size of the growth. Lipiodol hardly ever ran into a lung abscess. Odd shadows in the chest were thrown by retrosternal goitres, which could be diagnosed if the

patient were asked to swallow while being screened —no other tumour of the chest would move.

Dr. R. A. YOUNG emphasised the importance of team-work and correlation and strongly supported Dr. Chandler's protest against the statement that radiology gave the earliest indications of phthisis. It was dangerous to take a negative radiogram as proving a negative, and to ascribe shadows to miliary tuberculosis without good reason. He hoped that the Section would draw up a standard—though not a stereotyped—form of report. He pointed out the great value of radiology in diagnosing interlobar conditions. The lateral view was often of great assistance. He thought that failure of lipiodol to enter an abscess was due to œdema of the bronchus. He declared his belief that malignant disease of the lung was on the increase. Teratomata should be treated surgically because of their irritant nature and of their liability to malignancy.

Dr. MELVILLE briefly replied.

SECTION OF MEDICINE.

AT a meeting of this section held on Nov. 24th, the chair was taken by the President, Dr. H. MORLEY FLETCHER, and Dr. ROBERT HUTCHISON opened a discussion on

Nervous Dyspepsia.

To simplify the discussion, he defined dyspepsia as any discomfort during digestion which had origin in the stomach, and remarked that "nervous" was not synonymous with "functional" dyspepsia, although most functional cases were of nervous origin. He distinguished three groups of nervous dyspepsia: the psychoneurotic, of central origin; fatigue dyspepsia, apart from any mental perturbation; and a psychogenic group in which no disorder of gastric function could be demonstrated and in which the symptoms might be due to a lowering of the threshold of consciousness. In functional dyspepsia he recognised two groups: the hypersthenic and the asthenic, the former produced by exaggerated nervous excitability, through the vagus, as in the "live wire" type of man, and the latter by fatigue and depressing emotions. Possibly the endocrine system was responsible for the "fatigue" cases. The psychogenic group included the type known as the "visceroptotic" or "abdominal" woman. The gastric mucosa had no sensibility normally, but it was difficult to explain all the forms of gastric pain without assuming at any rate that under certain conditions impulses originating in the stomach reached consciousness.

The symptoms were rarely severe; discomfort, fullness, flatulence, and nausea. They varied greatly from day to day and were not much influenced by diet. Wasting was the result of over-dieting only. The presence of real pain negatived a diagnosis of nervous dyspepsia. Diagnosis could only be made by exclusion, based on a careful history, and thorough physical examination, radiography, and test-meals. Treatment should aim at removal of the cause, but might have to be symptomatic until the cause was removed, or if it was irremovable. The hypersthenic type needed bland diet, antacids, bromides, and belladonna. The asthenic type needed a dry diet, tonics, and physiotherapy. In the fatigue cases rest was an obvious measure. The real difficulty lay in the treatment of the psychogenic cases, for which no measure seemed to be even reasonably satisfactory.

THE PSYCHOLOGICAL POINT OF VIEW.

Dr. T. A. ROSS said that more than half his psychoneurotic patients suffered also from dyspepsia. He agreed with Dr. Hutchison's classification. He thought that many of the psychogenic type were really psychotics; patients with a fixed idea which the physician was not allowed even to approach. The psychoneurotic might not believe what the doctor said but would give him a hearing and be interested. The "abdominal" woman would not hear of any diagnosis which did not involve physical treatment. Another mark of the psychotic was that she was greatly helped for the time by any form of treatment sufficiently painful; she resembled the patient with self-accusations that had not been made conscious who desired punishment.

He thought that the fatigue cases might often be accompanied by anxiety, which was not always easy to discover. Often the full "voltage" was there but the patient was afraid to use it. Both exhaustion and dyspepsia were symptoms of a previous common factor of anxiety. The treatment might be radical or palliative. A palliative psychological treatment was well worth while; it should consist of discussion of current anxieties. One of the most important anxieties was diet; if the patient could be made to see that practically all foods offered in an ordinary household were digestible he would probably be able to digest them. His financial difficulties should also be discussed. Dieting and drugging a dyspeptic relieved him of responsibility and gave him support, and thus helped his trouble psychologically. All palliative treatment boiled down to relief of responsibility. Radical treatment involved some form of analysis, which was often impracticable and yet which often arose out of a palliative treatment. Patients would sometimes deny anxiety for a very long time. The aim of psychotherapy was less the relief of symptoms than ascertainment of the cause of anxiety.

Dr. H. BEDINGFIELD regarded nervous dyspepsia as an entity to be differentiated from the physiological protective dyspepsia produced by fatigue or mechanical causes or by chronic intestinal invalidism. The digestive symptoms (apart from infancy) did not usually appear until after puberty and there was no failure of energy or permanent disturbance of nutrition, while resistance to infection appeared to be actually increased. All these features distinguished nervous dyspepsia from that of the chronic intestinal invalid. The condition was as common in men as in women, but in women the symptoms usually appeared between 18 and 20, and in men between 25 and 26. Pain, if present, was more often felt in the upper abdomen. The cases fell into two groups: one in which the symptoms were intermittent and the other in which they persisted, accompanied by signs of emotional and nervous instability. Physical examination revealed nothing.

The cases could only be explained by regarding man as composed of two personalities: the old, vegetative personality and the young, cortical mind. The trouble could always to traced back to early infancy. The integration of the cortical personality was essential for health. In infancy disorders of the cortical personality manifested themselves through the nutritional functions; the urge to feed and satiation were antecedent to the dawn of mental life, and were present to reflect any disturbance brought about by unsuitable diet, congenital defect, or lack of harmony in the development of cortical personality. Only the third factor played any part in the ætiology of nervous dyspepsia. The gastro-intestinal tract was the only psycho-sensory mechanism available to express any conflict between the infant and its

environment. At every stage of development there must be compromise between the ego and the instinctual urge. Compromise might be brought about by sublimation; by absorption, after reaction of the ego with a feeling of guilt; fear or anxiety, or by repression. In the second case the individual became timid or cautious and avoided situations that reconstituted the early conflict. When he had to face them he reacted on the primitive level, and suffered from anorexia, nausea, vomiting, and constipation. Reflex disturbances might be set up elsewhere in the alimentary tract if the symptoms were not dealt with satisfactorily at first. The repressed case presented a more difficult problem; in severe cases analysis was the only treatment. The severe cases of "chronic abdominal woman" were undoubtedly psychotic; but the borderline was a very fine one between maladaptation due to inferiority and use of inferiority as a psychotic symptom.

THE "DIET" FALLACY.

Dr. J. A. RYLE said that many factors were involved: constitutional, environmental, and habitual. He would add to Dr. Hutchison's list dyspepsias largely due to nervous tricks such as aerophagy. Flatulence was a very prominent symptom in nervous dyspepsia. Perhaps aerophagy was rather a symptom of the anxiety state than a cause of dyspepsia, but occasionally it seemed to be the sole trouble and could be cured at a sitting. The chronic anxiety patient nearly always suffered from it. The situation should be explained to the patient, and other anxiety factors should be sought. Mis-treatment usually took the form of dieting. Dyspepsias were not due to food in the majority of cases. Patients gradually eliminated articles of diet and became thin. They resembled patients with anorexia nervosa. Doctors would do their patients more good if they encouraged them to eat more rather than less.

Dr. W. LANGDON BROWN spoke of war cases of atonic dilatation, due merely to sympathetic inhibition from anxiety states, and thought there was probably some nervous factor in addition to fatigue in cases of atonic dilatation. Many cases of "atonic dilatation of the stomach" were not atonic at all. He strongly supported Dr. Ryle on the matter of diets. This was a generation that sought after a diet and would not be satisfied until it got a diet. Whether it was right to take some of the responsibilities away by giving a diet was doubtful. Many ideas about diet had no scientific sanction but had become incorporated into a tradition. He also agreed with Dr. Ryle about the importance of air-swallowing. The worst case of the "chronic abdominal woman" type in his experience had been a man.

DISCUSSION.

Dr. PARKES WEBER declared that almost every case labelled "nervous dyspepsia" should be regarded as an exaggeration of the normal nervous protective reactions essential to health and longevity. A busy man who tried to take a heavy meal hurriedly between a busy morning and a busy afternoon might vomit on the journey back to work; he should not try to do it, and would pay for his mistake by abdominal disease and early death. Those who were protected by nervous reactions were more likely to live to healthy old age.

Dr. A. E. BLACKBURN, speaking as a general practitioner, said that the commonest form of dyspepsia in infants and adults was intolerance of fats. There was a threshold for the stomach as for the kidney, both in volume and in form of food. Fat was the commonest thing beyond the threshold of nervous people.

Dr. F. STOLKIND described cases in his experience, showing the influence of the mind on the body.

Dr. MIRVISH spoke of the difficulty of assessing functional and organic causes. Many cases now regarded as organic had for many years been labelled "functional." Gastritis was now known to be very common. Patients had dull, boring pain and an area of localised tenderness in the epigastrium, and in a nervous individual many symptoms and signs would be superadded. Only the psychogenic category could strictly be called "nervous dyspepsia."

Dr. HUTCHISON replied. He thought that finicking menu-writing was quite unnecessary, but that certain simple rules should be impressed on the patient. The liver rather than the stomach was at fault in cases of fat intolerance.

REPORTS AND ANALYSES

STRENGTH OF WHEAT.

(ENERGEN FOODS CO., LTD., ENERGEN WORKS, WILLESDEN.)

"Strength of Wheat" which is a light and hard gritty powder, claims to be a perfect food for growing babies, children, adults, and invalids. It is prepared by stirring the desired quantity into boiling water to which a little salt has been added and cooking the mixture for a few minutes. It is then served with cream or milk.

When analysed the following results were obtained:

Moisture per cent.	12·86
Ash " "	0·42
Fat " "	3·10
Protein " "	16·45
Carbohydrates "	67·17
Calorie value per lb.	1680

If compared with the composition of ordinary wheaten flour it will be noted that the fat and protein contents are materially higher.

When made according to the directions given the "Strength of Wheat" food is attractive to the palate and it is obvious from the figures above that it possesses a high nutritive value.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. H. H. Fisher to be Surg. Lt.-Comdr.
Surg. Lt. C. H. Birt to *Victory*, for R.N. Barracks.

ROYAL ARMY MEDICAL CORPS.

ARMY RESERVE OF OFFICERS.

Lt. Cols. E. G. Ffrench and A. C. Osburn, having attained the age limit of liability to recall, cease to belong to the Res. of Off.

Capt. E. E. Lightwood to be Maj.

TERRITORIAL ARMY.

Capt. J. N. Atkinson, R.A.M.C., to be Divl. Adjt., 44th (Home Counties) Div., vice Maj. W. H. A. D. Sutton, R.A.M.C., who vacates the appt. on completion of tenure.

Maurice Ellis (Rydal Sch. Contgt., Jun. Div., O.T.C.) to be Lt.

INDIAN MEDICAL SERVICE.

Col. W. M. Houston retires.

ROYAL AIR FORCE.

Flight Lt. T. J. D. Atteridge is promoted to the rank of Squadron Leader.

Flying Officer C. M. Leckie relinquishes his temporary commission on completion of service.

REVIEWS AND NOTICES OF BOOKS

Dairy Bacteriology.

Second English edition. By ORLA-JENSEN, Dr. Phil., D.Sc., Professor of Technical Biochemistry in the Royal Technical College, Copenhagen. Translated from the Danish by P. S. ARUP. London: J. and A. Churchill. 1931. Pp.198. 18*s*.

Bacteriological Control of Milk.

A Practical Guide for Media Preparation and Milk Testing. By A. G. HOUSE. Printed for the National Institute for Research in Dairying at the University Press, Cambridge. 1931. Pp. 59. 3*s*. 6*d*.

Dr. Orla-Jensen states in his preface that he has omitted every aspect of dairy practice which has no bacteriological interest, and has dealt with no bacteriological problems which have not some bearing on dairy practice. The resulting work is comprehensive and valuable. Excellent accounts are given of the souring of cream, the normal bacteriology of butter and of cheese, and the bacteriology of defects in these different products. Particularly useful are the careful explanations of bacteriological actions; the author shows how these should be used to guide dairy practice, and points out also the bacteriological changes which are the basis of successful empirical methods used in dairy work. The account of the different types of bacteria and their characters is inadequate; more complete descriptions of the various strains associated with bacterial changes are needed. The author's longer work on "The Lactic-Acid Bacteria," published in 1919, is not readily available, and the meagre descriptions given here are insufficient for purposes of identification. The account of the cleaning and the production of milk is interesting, but in many respects inferior to that given in many English books. The advantages of steam sterilisation for milk vessels are not stressed as they should be. The bacterial and chemical changes caused by heat treatment, including pasteurisation at various temperatures, are considered, but not in great detail. To one conclusion, that heating milk to 60° C. for 10 to 20 minutes kills all tubercle bacilli, many experts in this country will not subscribe.

On what may be called the public health aspects of milk the volume is inadequate. For example, tuberculosis is discussed only superficially, no adequate account being given of the bacteriology of bovine mastitis or its relationship to human disease; bacteriological means for judging the purity of milk and as a measure of control are not really discussed nor are the satisfactory procedures described. On the other hand, a clear description is given of certain tests, including the leucocyte, catalase and peroxidase tests, designed to show whether high temperature pasteurisation has been performed; the amylase test and a cremometric method devised by the author to show whether holder pasteurisation has been carried out are also noted. These tests may be of value for particular purposes. Prof. Orla-Jensen lays great stress upon the fermentation test and upon the reductase test for judging the purity of milk, particularly in connexion with dairy products; these tests are described in detail. The reductase test is widely used for milk grading in Denmark.

The work is largely a record of Danish work, and of the author's own experience, although American and Continental reports are utilised to a considerable extent. The volume undoubtedly loses by the entire omission of all work done in Great Britain—we have found but one reference to work done in this country—but none the less it is a valuable addition to the literature of the bacterial changes in milk and milk products, although it cannot be recommended as a guide upon the control of the milk-supply and its safeguarding from infection with pathological bacteria.

The practice by large milk-distributing companies of employing persons, who have received a special training in dairying, to control the bacteriological quality of the milk from the farm, and of the milk delivered to the consumer, has increased in recent years. In the work of training these persons the National Institute for Research in Dairying at Reading has been prominent among the dairy colleges. It is appropriate that a small hand-book, by Mr. A. G. House, which has a foreword by Dr. Stenhouse Williams, should be issued from that institute as a guide to these workers. The book is not a treatise on the bacteriology of milk; it does not deal with the control of milk in the way its title would suggest, but it gives details of the preparation of the various media required and describes the methods of estimating the bacteria in milk generally practised in this country. No mention is made of the direct estimation of bacteria in milk by the method of Breed or of the little plate method of Frost. Pathogenic organisms are not considered from any point of view. The reductase test of Barthel and Orla-Jensen, which is largely used for milk in Denmark, particularly in relation to butter making, and to a small extent in this country, is fully described; this is an easily applied test of keeping properties, though it gives but a rough measure of the bacterial content. The scope of the book is limited, but it provides trustworthy guidance for those engaged in the control of the quality of milk.

The New Conceptions of Matter.

By C. G. DARWIN. London: Bell and Sons. 1931. Pp. 192. 10*s*. 6*d*.

IF ordinary people, incapable of mathematical thought, want to understand the invisible structure of the world described by physicists, they must almost always translate the description into some kind of model. Atoms were easy enough; they could be represented as little round masses packed together like a pile of billiard balls. There was no more difficulty when the atom was dissected into protons surrounded by electrons. But when electrons and protons became charges of electricity it was hard to turn them into anything which in imagination was tangible. Prof. Darwin deals here with the further complications which have arisen. It appears now that an electron may be at once a group of waves and a particle; one cannot dream of a model of anything like that, nor does it seem to be conceivable except as a mathematical expression. To present ideas such as this in a popular and intelligible form is obviously difficult; we congratulate Prof. Darwin on his success. Among many other things, it is interesting to find that physicists have come to the old conclusion of biologists—that you cannot investigate a thing without altering it.

Brain and Personality.

By PAUL SCHILDER, M.D., Ph.D., Research Professor of Psychiatry, New York University. New York: Nervous and Mental Disease Publishing Co. 1931. Pp. 136. $3.

THIS book contains the essence of a course of lectures delivered by Prof. Schilder. They are divisible into two series, the first dealing with the psychological aspects of cerebral neuropathology, and the other with the neuropsychiatric aspects of the motility of schizophrenics. In a pleasantly discursive fashion the author roams over such apparently unrelated topics as consciousness, tonus, encephalitis, agnosia, or narcolepsy, selecting for discussion those points in which he imagines light can be thrown on the psychical questions involved by some consideration of the underlying pathology in cases regarded as "organic." While the neurologist may take exception to some of his statements and inferences, the more general question arises as to how far, and in what way, psychical integration can be explained by lesions structural in nature. For instance, it is surely problematical whether "regression to childhood" in a case of encephalitis can be correlated with "subcortical lesions of the brain," for here lies confusion between destruction of neural tissue and manifestations of a positive kind. A similar confusion is illustrated in the remark that "neurotic tic" is associated with involvement of "the striopallidal system." In the second part of the book the critical reader will note the same unsatisfactory allocation of phenomena of the psychical series to underlying "organic" change, but the work throughout is interesting and informative.

The Conquest of Old Age.

By PETER SCHMIDT, M.D. Translated by EDEN and CEDAR PAUL. London: George Routledge and Sons, Ltd. 1931. Pp. 314. 21s.

THIS work embodies the observations and conclusions of a writer who for ten years has interested himself in the subject of "rejuvenation" operations. In 1924 Dr. Schmidt gave his opinion of Steinach's operation and reported on 100 cases that had been under his care. The present volume contains much fresh material and is a comprehensive study of all methods of rejuvenation. It is written not only for the doctor but for the layman, since, in the author's opinion, the latter has the right to know what hope science can hold out for the prolongation of useful life. It is not death but the indignity and discomfort of old age that appals the average human being, and the advocates of rejuvenation operations have wisely laid stress on the advantage of extending useful life rather than on the mere multiplication of years. Even the antagonists of rejuvenation operations will be forced to admit that Dr. Schmidt has tempered his enthusiasm with restraint and judgment. He does not claim that old age can be prevented, but he believes that it can be postponed. In so far as his claims can be tested, he has tested them.

In order to be able to discount a common explanation of improvement after vaso-ligature—namely, that the patient is responding to the force of suggestion—he performed the operation during a stay in China on several Chinese who were ignorant of the object he had in view, and obtained many positive results. He also brings to the support of his claims such objective facts as a growth of new hair, an increase in body-weight, an improvement in the colour of the skin, and an alteration in the patient's handwriting. Statistical data he cannot furnish, for although Dr. H. Benjamin undertook a statistical examination of similar material and reported that 77 per cent. of his operations could be considered successful, it can easily be seen that the application of statistics to such a subject is impossible. All that an investigator can do is to examine his case-sheets with as impartial a scrutiny as is possible, and decide whether vaso-ligature and testicular grafting have any effect in ameliorating the signs and maladies of old age. This Dr. Schmidt has done with obvious fairness and with as much impartiality as can be expected of one who is admittedly an enthusiast.

Although the book deals mainly with the results obtained in males, Dr. Schmidt also deals with rejuvenation methods applicable to the female—for example, irradiation of the ovaries in doses so graded as to put out of action ovulation and at the same time increase the activity of the interstitial tissue. He also describes methods of local rejuvenation, such as the application of diathermy to the face. It is unfortunate that the work of Steinach and of Voronoff should have been discussed in an atmosphere of hostility and emotion rather than in the judicial spirit of science. The fact that the word rejuvenation supplies unscrupulous persons with an excellent method of preying on the credulity of the public cannot destroy Prof. Steinbach's reputation as a scientist. Even if the successes claimed for his methods when applied to human beings are less dramatic than those seen in the laboratory, vaso-ligature is worthy of the impartial scrutiny of the medical profession. To all those interested in the subject we commend this book.

La pathologie du système pallido-strié.

By P. VAN GEHUCHTEN, Professor at the University of Louvain. Paris: Presses Universitaires de France. 1931. Pp. 52. 4 belgas.

IN a comparatively slender monograph Prof. van Gehuchten has written a good, modern account of the syndromes usually considered to be related to lesions of the corpus striatum and its connexions. He deals in succession with parkinsonism, chorea, athetosis, Wilson's disease, and with still others, and if the descriptions are somewhat condensed nothing of importance is omitted. Proper attention is devoted to the pathology of the various syndromes, and in this respect the author's faculty of taking a wide view and of appreciating difficulties of interpretation comes out prominently. It is gratifying to find a recognition of the physiological nature of the problems involved—e.g., in the case of the so-called syndrome of the body of Luys. Where the matter is complex, definitions of the sense in which he employs certain terms might have made his exposition more clear. To affirm that the globus pallidus is the "centre of primitive automatism" assumes that automatic and voluntary movements can be rigidly separated, a view to which many cogent objections might be raised, and his further contention that the same ganglion becomes the centre for "acquired automatisms" is no less subject to criticism. That a person repeats the Lord's Prayer with his globus pallidus, or plays a favourite sonata with it, or walks with it, can scarcely be discussed seriously.

THE LANCET.

LONDON: SATURDAY, NOVEMBER 28, 1931.

ISOLATION OF THE MALE SEX HORMONE.

DURING the last two years very great progress has been made in knowledge of the nature and properties of the sex hormones. In the summer of 1929 E. A. DOISY and his co-workers announced the preparation of the female sex hormone (variously named œstrin, theelin, folliculin, or follicular hormone) in crystalline form, from the urine of pregnant women, and within the short space of about six months A. BUTENANDT brought out a paper in which the chemical and physical characteristics of the pure substance and some of its derivatives were fully described. The substance proved to contain only carbon, hydrogen, and oxygen, and to have the formula $C_{18}H_{22}O_2$. Of the two oxygen atoms one is present as a hydroxyl group and one as a carbonyl group. The former confers slightly acid properties on the molecule, and thus greatly assists in the task of isolation. The substance when isolated is of extraordinary activity. As little as one forty-millionth part of a gramme of the purified crystallisate may produce the changes of œstrus in a castrated mouse, whilst doses of the same order spread over a few days cause a marked growth of the uterus and development of the vagina in rodents.

By comparison, investigations of the male (testicular) hormone have, until quite recently, lagged far behind. As is not unusual in this kind of work, the great difficulty has proved to be the absence of an adequate test for this hormone. In 1911 A. PÉZARD showed that the development of the comb of the cock is dependent on it, and that in castrated birds (capons) growth of the comb follows injection of active extracts. F. C. KOCH and his co-workers in Chicago have developed this into a test for the hormone which has found favour with other workers on this subject (E. LAQUEUR, S. LOEWE, C. FUNK, B. HARROW, E. C. DODDS, W. SCHOELLER, and their co-workers), and may probably be regarded as giving a reasonably quantitative estimate of the activity of various preparations of the hormone. From the work of these investigators, it has been known that the hormone resembles the female hormone, œstrin, in many of its chemical and physical properties, being, for example, capable of distillation in high vacuum and remarkably stable to acids and alkalis. The early extracts were prepared mostly from bulls' testicles—an unfavourable starting material, which could be replaced by urine—when LOEWE and also FUNK, HARROW, and A. LEGWA found that an appreciable quantity of the male hormone appears normally in the urine. By extraction with solvents (benzene or chloroform) a crude oil was obtained which showed the characteristic comb-growth when injected into capons.

Although considerable progress was made by the investigators named above and by others, it is to BUTENANDT'S latest work [1] we owe the biggest advance in the chemistry of this hormone. Impressed by its close similarity with the female hormone, he has applied to it the methods of purification successfully used for œstrin. By fractionation of the crude oil prepared from male urine between suitable mixtures of solvents, by acid and alkali hydrolysis, and finally by distillation in a high vacuum, the weight of substance necessary to produce a definite response in the animals was reduced from 20–30 mg. to about 0·3 mg. At this stage the further purification of œstrin had been based on its acid nature—a property lacking in the hormone under discussion. KOCH, in 1930, had suggested that the action of esterifying reagents in destroying the activity suggested the occurrence of an hydroxyl group in the substance. Many reagents were tried by BUTENANDT and his collaborators, who finally found that hydroxylamine formed a crystalline compound (melting-point 215° C.), one-tenth of a milligramme of which still showed activity after recrystallisation. By hydrolysing this oxime with dilute acids, mixed crystals of two substances were obtained, one of which, present to the extent of 5 per cent. only in the mixture, proved to be a substance of the greatest activity. It was separated by fractional sublimation in a vacuum of one ten-thousandth of a millimetre of mercury, when a sublimate was obtained melting at 178° after recrystallisation from dilute alcohol. This substance, injected in doses of one ten-millionth of a gramme into capons, provoked marked comb-growth, and is much the most active substance yet obtained. It seems likely that it is indeed the crystalline male sex hormone, though as to its complete purity BUTENANDT is as yet unwilling to make a definite pronouncement. He points out that the hormone is accompanied in the urine by compounds of very similar chemical behaviour—a fact which has been responsible for the difficulty of preparing the pure crystalline compound.

The amount obtained is extraordinarily small, and the work is indeed a triumph of the use of modern micro-methods in chemical manipulation. BUTENANDT has been able to isolate, through the collaboration of the firm of Schering-Kahlbaum, from approximately 25,000 litres of male urine a total amount of only 15 mg. of the purified crystalline substance. Based upon this minute quantity, the full description of the chemical properties is naturally preliminary. Nevertheless, the probable formula $C_{16}H_{26}O_2$, based on duplicate analyses, may be advanced with some confidence, and the presence of a ketone group has been established by the preparation of the mon-oxime, which contains the correct percentage of nitrogen for that derived from a substance of the above formula. The rest of the oxygen is probably present as an alcohol group, though this belief is based as yet

[1] Zeit. f. angewandte Chem., Nov. 14th, p. 905.

on qualitative evidence only. The substance, unlike œstrin, appears to be neutral and fully saturated, taking up no bromine when treated with this reagent. It is an interesting observation that, but for the formation of the mixed crystals of the oxime with the impurity which accompanies it in the urine, the isolation of so small a quantity of the substance would hardly have been possible. More remarkable is the close chemical similarity which this study has revealed between the male and female sex hormones. It has often been observed that a very slight change in chemical constitution may produce a fundamental physiological distinction.

BIOLOGY AND CIVILISATION.

Dr. H. H. DALE thinks that the development of civilisation in relation to scientific knowledge has been a little one-sided, and in the Norman Lockyer Lecture which he gave on Tuesday for the British Science Guild in the hall of the Goldsmiths' Company he expressed the view that biology had received less than its fair share of attention in comparison with chemistry and physics. Science, he says, has been busy making the world a better and more comfortable place for man to live in; ought it not to pay more attention to making man a better organism to occupy the world? Why not indeed. Let us begin with education and see that an intelligent appreciation of the fundamentals of biology is regarded as part of the necessary equipment of any educated man. At present there is a heavy bias in favour of chemistry and physics, and with the help of an extraordinary collusion between schools and universities, an eminent man of science on its physical side, who has passed through the normal curricula, may have preserved an aloofness from biological knowledge, of a degree quite impossible to the normally educated biologist in respect of physics and chemistry. The various disciplines of knowledge are their own interpreters, and the result of this is that highly trained scientists may be completely ignorant of the biological point of view, and think of animals and plants (if they think of them at all) as nothing but examples of applied chemistry and physics. What they think when their own leaders tell them that the units which compose the universe are conceived on a biological plan we do not know. Dr. DALE does not actually mention any immediate reform at the Universities; we would venture to suggest that in preparation for the biological education of the man in the street it would be easy to insist that no one has his scientific knowledge guaranteed by a B.Sc. degree unless he knows what biology is about.

Next let us spread abroad the fact that many of man's direct and obvious needs can be satisfied only through biological knowledge. The problems of parasitic diseases are at bottom problems of systematic descriptive and œcological zoology and botany. If we want to understand parasites we must be able to look at them from their own point of view, and see them as parts of a great corporation of live organisms. To invent chemicals to cure sleeping sickness is well enough, but it is as nothing compared to knowing the tse-tse fly and his varied kinds so well that we can guide his life and prevalence at will. And the trypanosome himself presents the old systematic problem: is there one species or several, and how far can the superficially distinct forms change one into another? It comes in rather a new form and will have to be settled by criteria which are at present unfamiliar, but it is the same problem that LINNÆUS set out to solve in the "Systema Naturæ." So too we have learned lately that some of the still outstanding difficulties in the epidemiology of plague can be explained by the confusion of two sorts of fleas so like one another that it needed the utmost refinements of diagnostic entomology to separate them.

Now questions such as these cannot with profit be approached ad hoc; we must come at them from a biological background and in a biological atmosphere. And how difficult it is for even the biological secretary of the Royal Society to achieve this Dr. DALE shows us himself when he trips over his own text and says that our methods of house heating are more primitive and less effective than the Romans had 2000 years ago. Less effective they may be if they are measured by the chemist and physicist in terms of therms per kilo of fuel; less effective they certainly are not if the biologist evaluates them in terms of radiant heat and moving air. And out of this biological foundation, what are we to do for man? We are glad to find no catchpenny recipe for "eliminating the unfit." The problem, as the lecturer said, is much more important and difficult than that. "Nobody," he says, "can suggest that, with our present knowledge, we can predict even the initial stages of a strictly scientific application of genetic principles to the problem of improving the human species. He would be a bold man who would attempt to define the type or types of human beings which a higher civilisation will need, or the policy to be adopted to attain them." We may be able to do so if we cultivate biology as we should.

RADIOGRAPHY OF THE NASAL SINUSES.

THE use of radiography in the diagnosis of disease of internal organs has made great progress during the last few years. Until lately, however, the technique of examining the accessory sinuses of the nose with X rays has not kept pace in the general advance. Even in the early days of radiology the method was useful to the rhinologist for the recognition of inflammation in the antrum or frontal sinus. At that time all it was expected to disclose was a relative radiopacity of the suspected cavity, together with some blurring of its outlines; or perhaps it would be used to decide whether inequality of the frontal sinuses on transillumination was due to asymmetry of these cavities or to disease. And here or hereabouts, indeed, its application has rested. Until quite recently radiography had not succeeded in furnishing a reliable

diagnosis of disease of the sphenoid or posterior ethmoid sinuses, nor could it indicate the condition of the mucous membrane or fluid contents of the large anterior sinuses.

Comparison of the brightness of one antrum with the other, although useful, has the disadvantage that the relative opacity may be due, not to disease, but to asymmetrical density of the bony walls. Moreover, past inflammation, by leaving a thickening and fibrosis of the lining of a sinus, also causes a relative opacity which may be a source of error. In most cases of sinusitis the diagnosis can be made by clinical methods—by tracing the nasal discharge to its source, by observing signs of inflammation of the appropriate part of the nasal mucosa, or, when necessary, by exploration of the suspected sinus. But, as we remarked not long ago,[1] it is now recognised that there is a group of cases with chronically infected mucous membrane, or with polypoid degeneration of the lining, in which rhinological examination is negative, and which return a clear fluid when washed out, although bacteriological examination of this lotion will give a growth of pathogenic organisms. A more accurate and delicate radiological technique has long been needed for the examination, at any rate, of the more obscure cases of sinusitis, and it now appears to be forthcoming. In an interesting paper, written from the rhinologist's point of view, Mr. R. GRAHAM BROWN,[2] of Brisbane, acknowledges that some years ago he looked upon radiographic examination of the sinuses as of small assistance, but improvement has come as the result of careful technique—especially from the use of standardised positions and of soft rays—greater experience in interpreting the films, and closer coöperation with the radiologist. Radiograms accompanying his paper show polypi and swellings of the mucous membrane which are clearly differentiated from the "air-shadow" of the antral cavity. He does not describe the details of the methods employed, but this lacuna is well filled by papers by Dr. RICHARD MITTERMAIER,[3] of Freiburg, and Dr. H. K. GRAHAM HODGSON.[4] All three writers agree that filling the sinuses with lipiodol, or other radiopaque substances, is unnecessary, since mucosal swellings and polypi can be well demonstrated without it, and it has the further disadvantages that it involves puncture of the antrum, and that it is misleading when the air is not completely displaced. They also agree in examining the patient in the upright posture, in which the respiratory movements are less conveyed to the skull than in the prone position, and (what is more important) the presence of secretion, at any rate in the antrum, can be proved by seeing a "fluid level" in the cavity. Dr. GRAHAM HODGSON rightly lays great stress on the necessity of standard positions for all cases, and he takes radiograms in six different positions so as to include all the accessory sinuses. These positions are chosen in such a way that the cavity under examination is kept clear of the denser bony shadows, and so that these are projected in such a way as to bear a constant uniform relationship one to another. The vertical, or "vertico-mental," position is used for viewing the sphenoidal sinuses projected through the floor of the mouth, and a novel position, the right and left oblique views, for projecting the posterior ethmoidal cells clear of confusing shadows.

These papers will repay study by rhinologists and radiologists, but enough has been said to show that the technical development of radiography has reached a stage where it can be of real assistance in the recognition or exclusion of disease of the sinuses.

[1] THE LANCET, July 18th, p. 138.
[2] Jour. Laryng. and Otol., Oct., 1931, p. 670; Nov., 1931, p. 736.
[3] Ibid., Oct., 1931, p. 661.
[4] Ibid., Nov., 1931, p. 729.

MAUDSLEY.

THE twelfth Maudsley Lecture was delivered before the Royal Medico-Psychological Association on Tuesday last by Sir HUBERT BOND, a Senior Commissioner of the Board of Control. If the audience expected a disquisition on psychiatric problems or on the responsibilities of the State towards the insane they were disappointed, but assuredly were fully compensated by what they got instead. For Sir HUBERT decided to recall to them what manner of man it was in whose honour the lecture he was giving had been founded, relying mainly on MAUDSLEY'S "own bringingsforth" for the estimates expressed. The choice of subject was excellent, for MAUDSLEY has been dead some 14 years, and that is a lapse of time during which it is particularly likely for memories of great personalities to become shadowy and inaccurate. Of the great man who has passed from the stage for that period, while the recollections of his seniors are not vivid, those of his juniors depend upon report. The generation of younger men are working in accord with his teaching and inspiration, but will be without the influence of contact. A little later and the great man becomes an historic character; researches are made into his life-history and his written works to ascertain from external and internal evidence what he did and how he came to do it. MAUDSLEY is one of those men who deserves, and will receive this pious meed of attention in due course; but in the meantime Sir HUBERT BOND has supplied us with a fine testimony to his qualities, which if mainly derived from writings, still has the additional charm of a personal record.

MAUDSLEY is esteemed as a learned and individual philosopher, and Sir HUBERT BOND'S eloquent essay constituted a proof that he rightly occupied this position. And his love of wisdom was manifested alike by a complete unity of purpose but an intention to advance that purpose by diffuse and diverse studies. MAUDSLEY appears to have adopted inquiry into the problems of mental disease as the object of his professional career somewhat by accident, but having entered upon that inquiry he pursued it devotedly and without intermission to the end of his life, bringing to bear upon it lessons drawn alike from intensive personal application and from a wide study of the precepts of philosophy. It was, said Sir HUBERT,

in order to comply with a regulation laid down at that time by the Indian Medical Service, that candidates for commissions should attend the practice of a mental hospital, that MAUDSLEY obtained a temporary residential post at the Wakefield Mental Hospital after a short period of similar work at Brentwood. He found in psychiatry at once an absorbing pursuit. At Wakefield the authorities, recognising his worth, invited him to remain, and the intention to enter the I.M.S. was changed; and within the year he was selected, although only 24 years of age, to become superintendent of Cheadle Royal. There he made his start as an author, and must at once have felt that he had within him the gifts of imagination, intuition, and lucidity, which throughout the rest of his life made his literary work famous. The first article from his pen which the lecturer was able to trace appeared in 1859 in the *Journal of Mental Science* and was entitled the "Correlation of Mental and Physical Force; or, Man a Part of Nature," and it will be seen from this title that the essay formed a prelude to his famous "Physiology and Pathology of the Mind." This work was published originally in one volume in 1867, and was at once recognised as a great contribution to philosophical literature, of which we have practical evidence in the fact that the volume on its issue became a text-book for purposes of Classical Greats at Oxford.

How for the rest of his long life MAUDSLEY dwelt upon the problems of insanity, illustrating their complexity, and elucidating their difficulty by personal records and beautiful pen, was set forth by Sir HUBERT BOND with full references, and he closed with the story of the Maudsley Hospital. The great project, which may well have been germinating in MAUDSLEY'S mind for many years, took actual shape in 1906, when he first spoke to others of the good results that might follow the founding of a centre for the study and treatment of recent or undiagnosed mental cases. Then in 1907 he offered to the London County Council the sum of £30,000 if they would build a hospital for the study of early cases of mental disorder. He stated as the principal objects of such a hospital the obviating of sending such patients to asylums, the promotion of research in the pathology of insanity, the improvement in provision for treatment, and the erection of an educational centre. As is well known, much time elapsed before the Maudsley Hospital became a reality, but during its short life it has amply justified the prevision and generosity of its founder. The full text of Sir HUBERT BOND'S lecture will be found in the next issue of the journal of the Royal Medico-Psychological Association, and all who read it will learn how amply the memory of MAUDSLEY deserves to be kept evergreen.

ANNOTATIONS

GENERAL MEDICAL COUNCIL: CHANGE OF PRESIDENT.

AT the opening of the present session of the General Medical Council, Sir Donald MacAlister resigned the position of President which he has occupied for 27 years. He has discharged the onerous and delicate responsibilities of the post with a zeal and efficiency that have commanded universal admiration. He has maintained the dignity of the Council before all men; he has never allowed his sense of professional responsibility to be blunted by ill-informed criticism, but equally he has never forgotten that the Council was instituted in the public interest primarily, and that the public weal must be the first consideration in its policy. To the universal satisfaction Sir Donald is retaining his seat on the Council. The Council proceeded to elect Sir Norman Walker to succeed Sir Donald MacAlister. Sir Norman, who is President of the Royal College of Physicians of Edinburgh, has for many years sat on the Council as the direct representative for Scotland, and throughout the whole period has been recognised by the Council, and also by the medical profession, as one of its strongest members. He is intimately acquainted with the working of the body, and especially anxious to maintain due relations between it and the Dominions overseas in the interests of the national good.

THE TOXINS OF INVASIVE BACTERIA.

ONE of the most striking of recent changes in the conception of bacterial infection has been in respect of the invasive or pyogenic group. A very great deal remains unexplained; but in the case of streptococci, pneumococci, and staphylococci the importance of exotoxin has become increasingly evident. It is obvious that the exotoxins procurable from these species are not exclusively responsible for all the symptoms of infection; antitoxic therapy is not the sure defence in pneumonia that it is in diphtheria. But animal experiments have shown in these three cases that exotoxin and antitoxin exist, and it is reasonable to suppose that antitoxin therapy may turn the balance between life and death in certain cases. The latest work concerns the staphylococcus and derives its inspiration from F. M. Burnet, who first emphasised the importance of staphylococcal toxin in connexion with strains from the Bundaberg disaster. The paper from the London Hospital, appearing at p. 1180, is the first in this country dealing with the therapeutic action of staphylococcal antitoxic serum, and indicates in a small series of cases that, as was anticipated, the method in one of limited but real efficacy.

The toxin itself has certain peculiarities; in particular its rapidity of action on intravenous injection, leading to death in ten minutes, separates it from most other toxins. Its distinction from hæmolysin and pigment is of interest, but its invariable association with hæmolysin makes it analogous to the streptococcal toxin. Bacteriologists are accustomed to grade the pathogenicity of staphylococci in terms of the pigment, and the recognition of toxin in

non-pigmented strains should make them reconsider their position. The effect of toxin in sensitising animals is of great interest, since the phenomenon of hypersensitivity to vaccines has been observed by many workers. The question must be raised how far vaccine therapy may really be active immunisation with toxin, and whether filtrates might not be equally efficacious. Work on this line was, in fact, initiated some years ago by L. S. Dudgeon, and reactions were in certain cases very severe.

It must be emphasised that, while the production of antitoxic serum on commercial lines is under way, this serum is not yet available for general use. This emphasis is the more necessary because so-called bactericidal sera are available and have not proved a success. There is wide confusion of thought on this point, and many practitioners are apt to employ "polyvalent antistreptococcal serum" when they really should employ, and mean to employ "Dick serum" or "antiscarlatinal serum," which is antitoxic. At present the main trend of serum therapy is along antitoxic lines, and this work at the London Hospital, which has been confirmed on a smaller scale by unpublished work at St. Thomas's Hospital, deserves attention. This new serum is not a miraculous remedy, but it is the first specific therapeutic agent in staphylococcal infection which has stood the test of animal and clinical experiment.

VARICELLA AND HERPES.

MANY observations connecting chicken-pox with herpes zoster have been recorded. An interesting addition to the collection comes from Dr. P. J. Braslawsky,[1] who describes an outbreak in a Kief hospital. In May, 1929, a little girl of 8, convalescent from scarlet fever, developed a typical thoracic herpes but experienced no discomfort with it. She had had varicella two years before. In the same ward with her were 11 children suffering from scarlet fever complications or convalescent. In order to test the theory that chicken-pox could be contracted by infection from herpes, seven of them who had not had chicken-pox were put in beds adjacent to that of the herpes child, and all developed typical chicken-pox with a greater or lesser rise of temperature. The incubation period was from 16 to 18 days from the time of appearance of the herpes on the first patient. The ward was completely isolated from outside; there had been no chicken-pox in the hospital for many years, and the children who developed it had all been isolated for more than 30 days on account of their scarlatina. By what can only be regarded as a coincidence, another child, in a scarlatina-diphtheria ward, developed an abdominal herpes about the same time. There is reason to think that she caused varicella in two other children, but in this case the experiment was less certainly controlled. A whole series of other children subsequently caught chicken-pox from these first nine, and the epidemic lasted nearly three months and affected 34 cases. The disease was typical throughout. The frankly scientific attitude of experimentation taken by those in authority at this hospital will hardly appeal to workers in this country. Nevertheless, now that the thing has been done, it cannot be denied that this outbreak provides a formidable argument for those who believe in the identity of varicella and herpes. The cases recorded in this country are so often open to doubt of the real source of infection that there has been room for scepticism despite the force of their numbers. Here is a control experiment under the ordinary isolation conditions of a fever hospital. Braslawsky suggests that many unexplained epidemics of chicken-pox in institutions may arise from isolated cases of herpes which have been overlooked. He also urges that herpes should be regarded as an infectious disease.

[1] Presse Méd., Nov. 14th, p. 1671.

CEREBRO-SPINAL FEVER IN THE ALDERSHOT COMMAND.

THE details of the outbreak of cerebro-spinal fever in the Aldershot Command during the first seven months of 1931 have now been recorded by Major C. Armstrong and others.[1] The total number of cases was 34, of which 13 were fatal—a mortality of 38 per cent. Of the 34 cases 24 were diagnosed bacteriologically and 10 clinically. Discussing the general diagnosis of the disease, the authors of the report emphasise the fact that influenza may simulate closely cerebro-spinal fever. If the cardinal symptoms of headache, vomiting, stiffness of the neck, and a definite or even a doubtful Kernig's sign are present it is imperative to perform lumbar puncture for diagnostic purposes. It is also advisable to carry out both a total and differential leucocyte count of the blood as soon as possible, for a high leucocytosis is almost a rule in cerebro-spinal fever; this test, therefore, is useful in differentiating the latter from such conditions as typhoid fever and influenza. In the opinion of Major Armstrong and his colleagues it is useful to test at the bedside the cerebro-spinal fluid withdrawn at the initial lumbar puncture, to find out whether it reduces Fehling's solution—especially if the cerebro-spinal fluid is clear and it is doubtful whether serum should be administered or not. The Fehling's solution is diluted 1 in 4 with distilled water and three times as much cerebro-spinal fluid is boiled up with it. If there is reduction of the Fehling's solution (providing the cerebro-spinal fluid is clear and the clinical signs indefinite) a strong point against the diagnosis of cerebro-spinal fever is made and serum might be withheld. If there is no reduction of Fehling's solution and the symptoms are suspicious, serum should be given even if the cerebro-spinal fluid is clear.

Twenty-four of the cases were treated with polyvalent antimeningococcal serum from various manufacturing firms; of these cases 13 died. Type I. serum, prepared by the Lister Institute from strains of meningococci isolated earlier in the outbreak, was then used in the remaining ten cases, none of which proved fatal. In comparing the two series of cases—namely, those treated with polyvalent serum and those treated with univalent Type I. serum—fulminating cases are excluded. Of the remainder 90 per cent. in each series were either hyperacute or ordinarily acute. Those treated with polyvalent serum showed a mortality of 42 per cent., while no deaths occurred among the cases receiving Type I. serum. In this connexion, it is to be noted that the laboratory investigators reported that they found no agglutinins for the local strains of meningococci in three brands of polyvalent serum. These figures greatly favour the Type I. serum, but among those treated with polyvalent serum were the first 23 cases that occurred. In most outbreaks of the disease the initial cases are usually more severe than the later ones, a point for which some allowance must be

[1] Armstrong, C., Fotheringham, J. B., Hood, A., Little, C. J. N., and Thompson, T. O.: Jour. Roy. Army Med. Corps, November, 1931.

made in comparing the figures. The serum was administered intrathecally in all cases, and almost always intravenously as well. The dose varied from 10 to 60 c.cm. according to the amount of cerebro-spinal fluid withdrawn, the condition of the patient, and the severity of the case. In the general management it was found that morphia was necessary for most patients to ensure rest and lessen pain. Calcium lactate (grs. 10 t.d.s.) appeared to have little or no effect in preventing serum sickness which developed in most cases of the series. There were no serious complications such as would render any patients who recovered permanently unfit for military service. During convalescence, two negative nasopharyngeal swabs were required before the patient was discharged from hospital. In the laboratory investigations meningococci were isolated in 18 of the 34 cases. In 13 of these the coccus was of Type I. and in one case Type II.; in the remaining four cases the type was not identified. The culture medium used was pea-trypagar taken to the bedside in a hot box, the fluid being plated direct; at the same time a quantity of cerebro-spinal fluid was taken in a sterile test-tube and kept at 37° C. until placed in the incubator. From the latter specimen cultures were made at intervals of 24 and 48 hours and often proved positive.

From Jan. 1st to July 31st 130 meningococcal carriers were admitted to hospital for treatment. None of them developed cerebro-spinal fever. Swabs were taken every fifth day, and the patients were discharged to duty after one negative swab. The average number of days under treatment of 99 cases discharged from hospital up to July 31st was 11·3. The majority of carriers were treated by nasal douching and gargling twice daily with a solution of potassium permanganate in normal saline immediately followed by 20 minutes' exposure in a special room where a 1 per cent. zinc sulphate solution was vaporised by means of a Levick's spray. A small minority of carriers were treated with the permanganate solution three times daily without any zinc sulphate inhalation. A small number received no treatment. The average stay in hospital of those treated with permanganate douching and zinc sulphate inhalation was 11·2 days; those treated with only permanganate solution 11·4 days, and those who received no treatment 11·7 days. Carriers were sought for from two sources—namely, contacts of cases and the general population of barrack room. The total percentage of carriers among 1032 contacts was 8·7. During the first two months of the year the percentage was only 4·7, while from mid-April until the end of July it was 14·1. Two known carriers developed the disease, one six days after the first nasopharyngeal swab and another later on the same day that the swab was taken.

From the administrative standpoint noteworthy features of the cases were: 1. The predominance of influenza as a predisposing cause. Nearly 15 per cent. of the cases had had influenza a few days or weeks before the outset of meningitis. There had been a very extensive epidemic of influenza and few of the personnel of the Aldershot Command could have escaped infection in either a mild or a severe form. 2. The widespread and irregular incidence. Cases show little definite sequence and often little connexion, but occurred irregularly throughout the military population. As in most recorded military epidemics, the disease tended mainly to affect recruits, 66 per cent. of the cases having had only one year's service or less. For practitioners in general the main lesson to be learnt or emphasised from the outbreak is the importance of "typing" the meningococci responsible, and the administration as early as possible of serum prepared from the homologous type strain. In dealing with an epidemic where the predominant type is already known, the homologous type strain serum should be given from the first. In sporadic cases or at the beginning of a future outbreak, the only course is to give polyvalent serum of undoubted potency until the type of meningococcus is determined. As recovery of the organism is often no easy matter, every source—cerebro-spinal fluid, blood, and nasopharynx—should be investigated as early as possible. Also, a procedure which has been strongly advised by previous writers is emphasised—i.e., the necessity of incubating some of the cerebro-spinal fluid in addition to plating it direct on a culture medium. Frequently the cerebro-spinal fluid thus enriched will yield a positive culture after one or two days when direct cultures are negative.

IMPORT DUTIES ON HOSPITAL EQUIPMENT.

THE Abnormal Importations Act, which received the Royal Assent on Nov. 20th, empowers the Board of Trade to make Orders imposing customs duties up to 100 per cent. ad valorem on all classes of foreign manufactured goods imported into this country during the next six months. As the title of the Act implies, its object is to check the importation of manufactured goods in excessive quantities. Within a few hours of the passing of the Act, the Board of Trade made the first Order. This subjects to a customs duty of 50 per cent. ad valorem 23 separate categories of articles, and it is probable that Orders will be made in rapid succession during the next few weeks.

Among the articles contained in the Schedule to the first Order are many which form part of the equipment and utensils required by hospitals and all these articles became subject to an import duty on Nov. 25th. Running rapidly through the Schedule we note that pottery, sanitary ware, glazed wall and hearth tiles, and domestic glassware are the four items which begin the list. Articles coming within these categories are used in great quantities by hospitals. The next item is metal furniture, but bedsteads and "aseptic hospital furniture" are exempt. The next item is cutlery, but surgical knives are excepted; scissors, on the other hand, are included, so that instead of the duties under the Safeguarding of Industries Act, which expired on Dec. 21st, 1930, this is a new duty of 50 per cent. on scissors. Large quantities of German scissors are supplied to hospital nurses, and scissors will probably be dearer in due course. Another item in the Schedule is gloves, but rubber gloves are excepted, the probable reason for this being that British makers of rubber gloves are said to be well able to compete with Continental and American makers. There are many other categories of goods which are now subject to duty on importation which are bought by hospitals, such as typewriters and electrical carpet sweepers. Also a comprehensive range of toilet preparations such as tooth paste, smelling salts, lotions and ointments, denture bowls, and nail polishers are contained in the Schedule.

Important as may be the effect on hospital bills of the application of a high rate of customs duty to the articles in the Schedule to the first Order, it may well be that subsequent Orders will also apply to other articles commonly used by the medical profession. For instance, Mr. Runciman, in the course of

his speech, specifically mentioned surgical instruments as one of the categories of articles which are being imported in abnormal quantities. It should not come as a surprise, therefore, if an early Order is made subjecting some kinds of surgical appliances to an import duty. It must also be remembered that the Board has power to apply the Act to every class of foreign manufactured articles, and if this power is used the effects of the Act may be far-reaching. Nevertheless there ought to be no immediate advance in the prices of any of the goods covered by a Board of Trade Order. The very fact that this article and that are made subject to import duties is evidence that there is an abundant supply—a superabundant supply of such articles in this country. Any attempt at profiteering should be discouraged vigorously; if buyers of hospital equipment are quoted substantially higher prices for goods affected by the Act they should require ample reasons for the increase before assenting.

EFFECTS OF EXPERIMENTAL GASTRECTOMY.

RECENT reports on the anæmia which sometimes follows gastrectomy give importance to a study of the effects of this operation in dogs, contributed by A. C. Ivy, J. E. Morgan, and J. I. Farrell.[1] During the past seven years they have performed total gastrectomy on 14 dogs which lived six months or more after the operation—some of them as long as five or six years—as well as on a similar number which did not survive nearly so long. After gastrectomy the animals needed about twice as much to eat, because much of their food passed undigested into the fæces, and it is interesting to note that they changed their habits to the extent of eating very slowly. Most of them showed compensatory hypertrophy of the duodenum in the course of the first six months, but not to any great degree, and none of them developed jejunal ulcer. Perhaps the most frequent cause of post-operative death was enteritis—a complication especially prominent during summer months—and this is attributed largely to loss of the bactericidal action of the gastric juice. Pyorrhœa was another sequela, but in no case was there any sign of stomatitis or glossitis of the type seen in human pernicious and other anæmias. Apart from these complications the most striking finding was anæmia. In only six of the 14 animals was this observed, and in three of these it did not appear until the animal became pregnant. In the other three dogs it was first noted four to eight months after operation; later it became severe and finally it proved fatal in two cases, anæmia and cachexia being the only causes of death discoverable at autopsy. In the third animal it was found possible to cure the anæmia by giving cod-liver oil by mouth and iron subcutaneously. The remaining three cases of anæmia were, as has been said, associated with pregnancy. In two of them it was possible to restore the blood to normal by cod-liver oil and iron administration, and this treatment was effective during a series of subsequent pregnancies in the same animals. In the third case the anæmia became so severe that death occurred in spite of blood transfusion. Commenting on these findings the authors mention the interesting fact that the earliest papers on pernicious anæmia deal very largely with cases in pregnant women. They think that the digestion of dogs after gastrectomy suffices in ordinary conditions, but cannot cope with extra demands for hæmoglobin, iron, and other necessary chemical bodies. The result of these or other emergencies is likely to be anæmia. Although the compensatory factors in the normal alimentary canal are fully adequate, such gross impairments as total removal of the external secretion of the pancreas or continual external loss of bile are more than sufficient to produce obvious insufficiency. They hold that total gastrectomy thus annuls the factor of safety, although it is usually possible by dietetic precautions to maintain health. The insolubility of iron salts in alkaline solutions often causes failure of absorption of necessary amounts of this substance, but as a rule, if the diet contains large quantities of iron and possibly other essential substances, no ill-effect will necessarily follow complete loss of the gastric secretions.

[1] Surg., Gyn., and Obst., November, 1931, p. 611.

LADY BRUCE.

WE regret to record the death of Mary Elizabeth, Lady Bruce, the wife of Sir David Bruce, which occurred at Artillery Mansions, Westminster, on Monday last. Lady Bruce was the daughter of the late Dr. J. S. Steele of Reigate, was born in 1849, and married in 1883 Sir David Bruce, who had recently obtained a commission in the R.A.M.C. From the beginning of her husband's distinguished scientific career she was his devoted helpmate. She assisted in the successful discovery of the cause of Malta fever which marked the beginning of Bruce's classic contributions to pathology, and later in Zululand she shared in the adventurous researches in South Africa which will associate the name of Bruce for ever with sleeping sickness. Many of the illustrations that accompanied Sir David Bruce's work were due to her skill with pencil and camera, and her husband was always both scrupulous and proud in the acknowledgments which he made of her invaluable aid. Lady Bruce received the Royal Red Cross for her nursing services in the South African War, and the O.B.E. for her coöperation with Sir David in much of his laboratory work during the Great War. She will be deeply regretted by a large circle of friends.

THE ÆTIOLOGY OF INFLUENZA.

FOR some time now it has been widely held that influenza has for its prime cause a filtrable virus, but the experimental support for this conception (Nicolle and Lebailly, 1919; Yamanouchi, Sakakami, and Iwashima, 1919; M. H. Gordon, 1922) has never been sufficiently convincing to dispose of the other ætiological claimants. The reason for this is not far to seek. Apparently none of the ordinary laboratory animals is susceptible to the virus of influenza and the human volunteer is unsatisfactory unless he is prepared to submit to the strictest isolation both before and during the attempted experimental transmission. The question of the causation of the common cold—a problem beset with the self same difficulties—has been answered by the brilliant researches of Dochez[1] and his colleagues; the causal organism is a filtrable virus. This success can be attributed to two main causes: the recognition of the susceptibility of the chimpanzee and the possibility of using it as an experimental animal; and the elaborate precautions taken to protect the experimental animals (chimpanzee and man) from infection from outside sources. Those who have followed Dochez's work must have realised that his technique was admirably suited to the study of influenza, so it is not surprising that we should

[1] THE LANCET, Sept. 5th, pp. 547 and 539.

read that P. H. Long, E. A. Bliss, and H. A. Carpenter [2] have already attacked the problem on these lines. Their experiments are few but suggestive. Nasopharyngeal washings were collected from early uncomplicated cases of influenza, passed through Berkefeld W. candles and inoculated into apes by instilling the filtrate into the nares and swabbing the nasopharynx therewith. Only three animals were inoculated, but all three, after an incubation period of 36–48 hours, became ill with fever, prostration, and leucopenia. The malady was transient and was unaccompanied by any rhino-pharyngitis, and to claim that the disease produced in these chimpanzees was influenza would be premature. But Long, Bliss, and Carpenter refrain from any such sweeping claim and modestly refer to these results as encouraging. The results of further work will be awaited with interest.

RESEARCH ON CANCER.

Dr. J. A. Murray's latest report as director of the Imperial Cancer Research Fund recommends that the layman should finally cease from regarding the cancer problem as a gamble where success is as likely to fall to the ignorant as the instructed. Thirty years of research, he says, have revealed that this problem has a complexity which was quite unexpected. The knowledge gained justifies the hope that perhaps progress in the direction of an efficient cancer prophylaxis is possible, but an advance along such lines will not be dramatic or sensational. "Whatever the future of the cancer problem will be, it is certain that it will not yield to the sound of a trumpet," and Dr. Murray hopes that his report will help to show why those engaged in this research preserve a conservative and cautious attitude towards "the recurring extravagant announcements" of new methods of treatment.

Writing of the work going on in the Fund's laboratories, he states that investigation of the mode of action of radium on normal and cancerous tissues has now reached a stage permitting of comprehensive treatment, and a scientific report on the results is likely to appear early next year. Along another line Dr. W. Cramer has carried on inquiries arising out of the curious fact that the incidence of cancer in particular organs varies remarkably in different countries where the total mortality from cancer is much the same.[3] From investigation of this phenomenon he has passed to a comparison of the incidence of cancer of the stomach in this country and abroad. In England it is responsible for 25 per cent. of the total cancer mortality in men, whereas in most European countries where accurate statistics are available the proportion is more than twice as high. Dr. T. H. C. Stevenson has shown that cancer of the stomach and upper alimentary tract is commoner among the lower social classes than among the well-to-do; on the other hand, for the lower alimentary tract the incidence is the same for all classes. A similar relationship has now been demonstrated in Bavaria, where among the working classes 60 or 70 per cent. of the total mortality from cancer is represented by cancer of the stomach. These figures are so high as to remind one of the conditions of occupational cancer, and on this analogy it would seem that where the disease so commonly attacks one organ there must be some external factor which can be avoided. It can already be stated, Dr. Murray says, that excessive consumption of alcohol is probably not the factor responsible.

From this approach to the problems of prophylaxis the report turns to Dr. R. J. Ludford's studies of the action of dyestuffs and colloids—studies directed towards finding a weak spot in the armour of the cancer cell towards which therapeutic attacks may be directed. The results, inter alia, strike a warning note on the use of colloids or semi-colloids in treatment and emphasise the possible danger of over-dosage in cases where the body may be offering resistance to malignant disease. Ludford's observations further provide additional evidence of the enhanced defensive mechanisms which characterise malignant growths. "The vulnerable side of the cancer cell, if it has any, has still to be discovered, and Dr. Murray gives little encouragement to those who believe that radium and X rays are more potent against cancer cells than against normal elements. It is, he thinks, probably more correct to ascribe the apparently specific effect of radiation in cancer to the delicacy of the indication of action provided by the arrest of growth of temporary disappearance following local destructive effects. Few normal cells, he points out, provide an indicator of the same kind or order of delicacy, and it is significant that the two tissues which do so—the testis and lymphoid tissues—behave like new growths. His review of these and similar topics leads Dr. Murray to the conclusion that we are not yet in possession of such knowledge of the properties of the cancer cells as would indicate clearly the direction in which a rational specific therapy of cancer should proceed.

MEDICAL MEN IN PARLIAMENT.

THE Parliamentary Medical Committee, which consists of all the Members of the House of Commons who are medically qualified, met on Nov. 18th and elected its officers. Dr. F. E. Fremantle replaces Dr. Alfred Salter as chairman; Dr. Salter becomes vice-chairman, Dr. J. H. Morris-Jones treasurer, and Dr. A. B. Howitt secretary. Dr. Fremantle has been in the chair before and returns there, as under the constitution of the Committee its chairman shall belong to the largest party in the House of Commons. Dr. Howitt is the immediate successor of Mr. Somerville Hastings both in seat and secretariat, and he follows in the line of active and valuable service initiated by Dr. Drummond Shiels and Dr. Walter Elliot. The Committee has the advantage of being joined in its deliberations by the two medical peers and is thus in a strong position as regards the more special aspects of internal medicine and surgery. Earlier in its history it used to invite to its council board one or another non-medical Member of Parliament, such as the late Sir Philip Magnus, whose sympathies were closely identified with professional matters. Public health has now a redoutable spokesman in the person of Captain G. S. Elliston, elected as Member of Parliament for Blackburn. Captain Elliston was for many years executive secretary of the Society of Medical Officers of Health and he possesses an almost uncanny knowledge of the personnel and material of the sanitary service. In the difficulties that face us of reconciling economy in the social services with a high degree of efficiency and a contented medical staff, Captain Elliston's knowledge and discretion will no doubt be at the call of the Committee.

[1] Jour. Amer. Med. Assoc., Oct. 17th, p. 1122.
[2] See THE LANCET, 1929, ii., 1149.

SOCIETY OF BRITISH NEUROLOGICAL SURGEONS.—The Michaelmas meeting of this society is being held at the rooms of the Medical Society of London, 11, Chandos-street, London, W., to-day, Friday, Nov. 27th, and to-morrow, Saturday. Mr. Donald Armour will preside.

SPECIAL ARTICLES

RUSSIA IN RECONSTRUCTION.

BY L. HADEN GUEST, *M.C.*, M.R.C.S. ENG.

II.*—THE INSTITUTE OF PUBLIC FEEDING.

THE five year plan of Russia was primarily one of building a solid foundation of heavy industry for the country's future complete industrialisation. But every aspect of the country's life had its own part in the plan, and the Health Department had a particularly important part. Certain parts of the five year plan have been completed, and those concerned have already turned their attention to the next stage of constructive work to which the medical plan of an Institute of Public Feeding properly belongs.

The preliminary organisational work of this institute was undertaken in the middle of 1930, and the plans of work were already being carried out in August, 1931, the headquarters of the institute being temporarily established in a building in Moscow belonging to the Commissariat of Health, which also includes a special rest sanatorium for communist workers and a small hospital. The control of the institute is in the hands of Dr. B. Sbarsky, formerly professor of biochemistry, and I had the advantage of hearing details of the plan in a personal interview on August 14th last in Moscow.

The outline plan of the institute is that of a scientific and technical bureau which shall guide and control the feeding and nutrition of the whole population of 160,000,000 people. In order to do this a great deal of preliminary scientific and technical work is being undertaken, and a staff of over 300 people selected for the purpose had already been at work for some time before August.

ITS ELEVEN SECTIONS.

The work is divided into 11 sections for purposes of research, which are as follows:—

1. The physiology of nutrition; the investigations are being conducted by a staff of 24 medical men and biochemists, who are studying the absorption of food, the value of foods in calories, the vitamins in food, and the effect of food on special organs of the body.

2. The biochemistry of nutrition; here a staff of 20 scientific workers are studying metabolism with special reference to albumin and sugar.

3. The hygiene of food and food preservation; this is employing the time of 25 trained workers.

4. A staff of 90 medical men and laymen are studying diet in illness. A unit of 100 beds is available for cases, and studies were being made in August on rheumatism, on colitis, on intestinal ulcers, and on various affections of the liver. Cases of rheumatism were being treated by diet alone with success.

5. A group of eight persons are studying the methods of education in diet and plans for publicity. The question of books of an educational nature, I found, was being considered, and the sphere of exhibitions investigated. Posters, lantern slides, films, broadcasting, and lectures were all being weighed up. The question of publicity in Russia is one of first-class importance owing to the vast area of the country and the relatively backward condition of many of the peasants from the educational point of view.

6. A section of ten persons are specialising in the general planning of the development of the institute and its work, and on the compiling and keeping of statistical records.

7. Practical organisation as regards restaurants, food-supplies, and all such questions absorbed the energies of 40 people.

8. A section has been organised for the special training in dietetic matters of doctors, chefs, and nurses, all of whom are to be brought up to date in their practical and theoretical knowledge.

9. Eighteen doctors and chemists are engaged in an inquiry dealing with the feeding of infants; and

10. Seven are specially concerned with the diet and nutrition of those undergoing Spa treatment at the numerous Kurorts which are freely available for factory and other workers.

11. Five people are studying army diet.

ITS AIMS.

The institute was an unknown quantity to the general public in Russia in August, 1931, although its extensive plans were already in process of realisation. And it was only after a good deal of the scientific foundation laying had been done—during 1930 and 1931—that the popular campaign to improve feeding was launched by the leaders of Soviet opinion during this summer. But already 7 million roubles had been voted for a new building for the institute, and this will be ready for occupation in 1933. In this new building there will be firstly the central scientific research nucleus, then around that a University of Nutrition, attached to which will be experimental and demonstration kitchens. Nothing concerned with nutrition will be excluded. The biochemist will have his work, the chef and the waiter will have theirs. A special magazine to deal with problems of nutrition was promised for this month, November. The study of diet in disease is directed not only to make diet curative but, by modifying diets in individual cases, to make it preventive. It is hoped in this way to prevent a breakdown of health of factory and other workers and enable them to remain at work.

Another question being investigated is that of the food norm required by different occupations. Experiments on diet and output of work are in process of being made in different classes of industrial establishments and on farms. The groups of workers investigated up to the time of my conversation with Prof. Sbarsky were (1) metal workers, (2) workers in chemical industries, (3) building trade workers, and (4) farm workers. Experiments had already shown that different numbers of calories and that different quantities of food and different food substances were required for maximum efficiency in different occupations. In order to carry out the experiments the factory dining rooms are placed under the control of the institute and investigations checked in the laboratories which are attached to the more modern dining rooms.

Prof. Sbarsky told me that while some of the factory restaurants and other restaurants were good, there were many which had serious faults. These faults were subsequently drawn attention to publicly and forcibly in a statement on public feeding coming from the communist party headquarters. Gross faults were dirt, bad service, and bad preservation of food. Less gross faults were unappetising and wholesale character of meals and lack of variety. Special attention was being paid to the question of preparing food in very large quantities and yet keeping it

* Part I. appeared last week and Part III. will appear in a subsequent issue.

appetising. Much attention was also being given to methods of organisation of receiving, preserving, preparing, cooking, and serving food.

A KITCHEN FACTORY.

Immediately after my talk with Prof. Sbarsky I visited Kitchen Factory No. 3 in an industrial district of Moscow. This restaurant served 18,000 dinners of two courses every day, as well as 7000 separate dishes. The hour of opening was 10.30 A.M., and it closed at 8 P.M. This particular restaurant was not attached to one factory, but situated in the middle of a group of 12–15 establishments, including textile mills and electrical and rubber factories. The building was a modern three-storied building, looking as if it had been built out of cubes, it was flat-roofed, and chiefly remarkable for the very large amount of window-space. The kitchen was on the top storey, big, clean, and equipped with steam and gas-cooking apparatus of a modern type. There was ample room for storage, preparation, and service of food in separate rooms, and the restaurants on two floors were large open halls holding 400 people each, plainly furnished with long tables and chairs for the diners, and food service counters for the waitresses. Each diner, before coming into the hall, had to obtain a food ticket and the price for a two-course meal was 35 kopecks. I had a meal with my companion. The food consisted of minced meat, potatoes, and vegetables, and a small cucumber of a kind very popular in Russia. My one-course meal cost only 25 kopecks and was quite appetising, but not enough for a hungry man. Attached to the main restaurant was a dining room where invalid and special diets could be obtained on prescription from a doctor, and adjoining this was a lounge with big chairs and couches, and an open-air extension on a flat roof projecting over the lower story. The room was pleasant and friendly, decorated with flowers, and delightfully quiet.

Close at hand was the laboratory of the restaurant which was in charge of a woman chemist. The calorific value of food supplied in the restaurant was checked daily. Questions of the quality of food could be referred to the laboratory, but in practice were apparently referred to a doctor attached to the restaurant. No bacteriological work was done, but the technical side of the cooking was watched. It is intended to use this laboratory, and others attached to similar restaurants, for future dietetic investigations. There is a system of food inspection carried out on all supplies arriving at the kitchen, and this is done by a doctor and a nurse acting together.

STANDARDISED RESTAURANTS.

There are many varieties of public restaurants in Russia at the present time. Some, like the factory kitchen described above, are large scale modern organisations. Some are small communal restaurants, or stolovayas as they are called, which are using old-time restaurant premises. But present tendencies point to the large factory kitchen type of restaurant as the one for standardisation. Six of these already exist in Moscow, and it is proposed to create others (some already exist) in Leningrad, Odessa, Kharkoff, Rostov-on-Don, Voronesh, and Novo-Sibirsk. The Soviet Government has budgeted for an expenditure of 2,200,000 roubles on restaurants during this year.

It is proposed to apply much the same kind of organisation to agricultural workers on State and collective farms. It needs to be realised that Russian farming of the new type is something outside of all ordinary farming experience. The State farm of Verblud, which I visited, is situated in the northern Caucasus region near Rostov-on-Don. This farm is essentially a township of 10,000 people, with machine shops, tractor garages, stores, communal restaurants, cinema, agricultural and technical colleges, and tenements for workers set in the middle of a farming area comparable with an English county. Workers of all grades live in the central township and go out to the part of the farming area where they are working in motors. The feeding problem is essentially the same as that of the town, with the difference that certain things, vegetables for example, may be easier to get. Collective farms are not on this scale at present, but they are equally communal centres in a farming area.

That the Soviet will achieve many interesting results by their scientific investigations of dietetic and nutrition problems in this very wide field should be certain, and the effort at scientific control of the feeding of 160 million people will be watched with the greatest sympathy by all scientific medical men. But Russia does not stop at scientific nutrition—she may go on to eugenics.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

ANNUAL MEETING OF FELLOWS AND MEMBERS.

THE annual meeting of Fellows and Members was held in the theatre of the College on Nov. 19th, Lord MOYNIHAN, the President, being in the chair.

Sir ERNEST GRAHAM-LITTLE moved the following resolution :—

"That this meeting of Fellows and Members of the Royal College of Surgeons of England reaffirm that it is essential that Members, who constitute nine-tenths of the College, should be admitted to direct representation on the Council, especially having regard to the striking result of the poll of Members taken last year."

He pointed out that the College contained some 2000 Fellows and 18,000 Members, and that the governing body of 24, the Council, was selected exclusively from the Fellows, and that no Fellow engaged in general practice had been elected. The Members, he said, represented the general practitioner element, their examination fees constituted the greater part of the College income, and they only asked for a very moderate representation. In support of this demand he quoted the figures obtained at a plébiscite vote last year, when nearly 7000 Members, resident in the United Kingdom and Irish Free State, out of some 12,000 Members to whom voting cards had been sent, voted in favour of representation.

Dr. H. H. Sanguinetti, seconded the motion, which was passed by 32 votes to 3.

Lord Moynihan admitted that the resolution had been supported by very fair speaking, but, as the Council was doing its duty sincerely in the interests of the whole College, he could not offer any hope for the representation desired.

By the permission of the President, Dr. T. Wilson Parry made the following statement, containing a suggestion that had received the explicit support of the Society of Members. He said :—

"It is my opinion that some Members of the Council, with every honourable and loyal feeling for the traditions of the College, have instinctive fears that if they permitted their ship to be embarked upon what appears to them to be uncharted seas they stand in some danger of having it wrecked on some unknown

or concealed rock. Believe me, Sir, there is no fear of this. But they want to feel, and not unnaturally, that they are protected against calamity of any kind. I have every sympathy with these men, as I have a profound respect for traditions that have lasted and, in many ways, answered for a certain spell of years. In order that such may be reassured against any contingency of this kind I have a proposal to make that I think may not be displeasing to Members of the Council. Among the vast numbers of medical men in general practice in this country are a sprinkling of Fellows of the College, and I wish to propose that, to begin with, the Members of the College shall be permitted to elect one Fellow, who is a bona fide general practitioner, together with one Member, who is also in general practice, to represent them on the Council, and that the Fellow so elected shall be in addition to, and not replace, any of the 24 Members now sitting on the Council, so that none of the rights of these Fellows may be in any way infringed. I further propose that if this should be found to work satisfactorily, as it certainly should, at a subsequent election, in a specified number of years to be explicitly agreed, the Members should be represented by two of their own number which, after all, is the only ideal and practical method of dealing with the case. The Council of the College would thus be safeguarding the traditions of the College at the initial step, and so insure an honourable settlement which should be satisfactory to both parties.

"The College is now undertaking research work in surgery, owing to the munificence of one who, all his professional days, was a Member of the College. Laboratories are being built at Downe in Kent, and no efforts will be spared to further new discoveries and treatments in the science of surgery. But, Sir, it is not by pathology and experiment alone that a great success in such an undertaking can be assured. Careful and patient observation in clinical practice is as essential as microscopic, cultural, and experimental work in the laboratory. Among the myriads of medical men in general practice, which I think, Sir, you will admit forms the backbone of the medical profession, are men who possess qualities which would be of undeniable assistance to supplement this great work and the material would be at their very doors. A coöperation between these two sections would surely be a magnificent thing for the furtherance of the great project you have before you.

"The history of medicine has revealed many striking facts. Robert Waring Darwin, the father of Charles Darwin, and the father, grandfather, and great-grandfather of more Fellows of the Royal Society than exist in any other single family, was himself a distinguished man, a thinker and philosopher, and, moreover, a general practitioner in his native town of Shrewsbury. Edward Jenner, the medical originator of vaccination, was a country surgeon in Gloucestershire, who at the instigation of John Hunter came up to London to give consulting practice a trial, but miserably failed; so returned to the country, there to practise and leave behind him a name which has since become immortal. Again, Sir, one who was personally known to many of us, in another branch of medical service, by the patient and prolonged study of the administration of digitalis in diseases of the heart, has won for himself undying distinction. James Mackenzie spent the greater part of his professional life in general practice in Lancashire. These are only three names. I could add more. I mention them merely to show what coöperation might mean in this great new undertaking of the College.

"For 40 years these annual meetings have been held, and what have they brought forth? Nothing tangible. I beg, Sir, that we may now leave the past behind with its feelings of the risks of representation on the one side and that of a rankling injustice on the other, and that we may together coöperate and concentrate on the great future of the science of surgery. Disunion is damaging to progress; but unity, Sir, is strength."

MEDICINE AND THE LAW.

Bequests for Antivivisection Purposes.

THE recent issue [1] of "The Fight Against Disease" contains a good account of the significant decision of the Court of Appeal in *Re* Grove-Grady, Plowden *v.* Lawrence. Mrs. Grove-Grady, it may be recalled, bequeathed about £100,000 in specific legacies to various antivivisectionist bodies, homes for animals and other similar institutions. The remainder of her estate, approximately £200,000, she directed to be devoted to found a new antivivisection organisation to be called the Beaumont Animals Benevolent Society. One object of the society was to be the provision of refuges or sanctuaries "for the preservation of all animals, birds or other creatures not human" in a wild state, so that all such animals, &c., shall be "safe from molestation or destruction by man."

The validity of this residuary bequest was disputed. English law has a bias against perpetuities, but a perpetual trust for a charitable purpose is lawful. Was this bequest a charitable trust? The question what is or is not a "charity" in this legal sense is somewhat technical. Certain classes of objects recited in the preamble to an Elizabethan statute are "charitable," and this ancient list has been applied and extended by judicial decision. One principle is that the disposition is void (and not charitable) if it is not for the benefit of the public or of living persons. According to this principle the benefit of animals is not in itself a charitable object; a trust to feed sparrows, for instance, has been held to be void. In 1895 (*Re* Foreaux, Cross *v.* London Antivivisection Society) Mr. Justice Chitty held (not without hesitation) that a gift to certain antivivisectionist societies was a good charitable gift. Many good lawyers, then and since, have thought his decision irreconcilable with the general principle already mentioned. Nevertheless in July, 1928, a judge of the Chancery Division followed Mr. Justice Chitty and decided that the Grove-Grady residuary bequest was valid. It seemed, however, that the benefit to the public had not been adequately established; moreover, there was reason to think that, in these two cases, too much weight had been given to the donor's intention to benefit the country instead of considering the evidence whether in fact the donor's intention resulted in such benefit. The Grove-Grady case was therefore taken to the Court of Appeal where the previous decision was reversed. The Master of the Rolls said that in the proposed sanctuary the fox and the rabbit, birds of all sorts "with the stoat and the weasel and rats as neighbours and hawks and crows as spectators," were to live and enjoy themselves after their kind. Such a purpose, he observed, "does not in my opinion afford any advantage to animals that are useful to mankind in particular or any protection from cruelty to animals generally." In his judgment it was clear that "decision that an object such as the testatrix defines in the present case is charitable would go beyond any case decided at present." Lord Justice Lawrence dissented; he thought a bird and animal sanctuary, conducted on rational lines, might cultivate a spirit of mercy towards the brute creation and thus might elevate human beings. He considered it might even "have a more elevating effect on human beings than many of the trusts in favour of animals which have been upheld as valid charitable trusts—such as, for instance,

[1] Quarterly Journal of the Research Defence Society (11, Chandos-street, London, W.). Autumn, 1931. 6*d*.

trusts to protect animals from vivisection." The third member of the Court, Lord Justice Russell, agreed with the Master of the Rolls, and expressed doubts whether the old decisions upholding dispositions in favour of animals would be held charitable to-day. "For instance antivivisection societies which were held to be charities by Mr. Justice Chitty, and were described by him as near the borderline, might possibly in the light of later knowledge in regard to the benefits accruing to mankind from vivisection be held not to be charities."

It is a pity that the Grove-Grady case was not finally reviewed by the House of Lords, in view of Lord Justice Russell's remarks. Notice of appeal was given but was withdrawn on a compromise reached by the Attorney-General, the next-of-kin, and the trustees of the will. The result was an agreed order that the Court of Appeal judgment should stand, save that a sum of £25,000 should be set aside for establishing in Great Britain homes or hospitals for animals "but so that no part of the said sum is to be available for antivivisection propaganda." Whatever views anyone may hold about the ethics or utility of experiments on animals, the Court of Appeal decision in the Grove-Grady case is of much interest on the point of law.

"Vapour Rub" and Stamp Duty.

The Medicines Stamp Act of 1812 imposes a £10 penalty on persons vending certain classes of medicines without a paper cover, wrapper, or label, provided by the Inland Revenue authorities and duly stamped for denoting the duty charged on the packet, bottle, or other enclosure. The *Law Times* reports a recent successful claim by the Crown under this enactment against a well-known firm of wholesale and retail chemists for having sold a preparation called "Vapour Rub" in a carton not containing any label or stamp denoting that medicine stamp duty had been paid.

The Act of 1812 which contains a remarkable schedule of contemporary pills, salves, syrups, ointments, cordials, pomades, balsams, tinctures, &c., affected by the stamp duty, also contains some strangely worded "special exemptions." Among these exemptions are mixtures sold by chemists, &c., "the different denominations, properties, qualities, virtues and efficacies of which . . . are known, admitted and approved of in the preservation, cure or relief of any disorder, malady, ailment or complaint incident to or in anywise affecting the human body." The defendant firm argued that its "Vapour Rub" was thus "known, admitted and approved of" because the formula could be found in the Pharmaceutical Formulas, described as "Chest Vapour Rub." Mr. Justice Rowlatt said he might have allowed this argument to prevail if the firm had called its preparation "Chest Vapour Rub" and had added a reference to the Pharmaceutical Formulas; but they had called it "Vapour Rub" simpliciter, a term used for the first time when they began to sell it in 1929. "Vapour Rub," said the judge, could not pass as "known, admitted and approved of" by reason of the fact that "Chest Vapour Rub" was so known, admitted and approved of, unless it was also known that the two preparations were identical.

The Solicitor-General, who appeared for the Crown, hinted that the shops were full of other preparations which were illegally escaping medicine stamp duty. If, however, there are many more such claims by the Crown, there will be overwhelming demand for the revising and rewriting of these anachronistic statutes. The Chancellor of the Exchequer promised a reform of this nature several years ago.

GENERAL MEDICAL COUNCIL.

PRESIDENT'S ADDRESS.

AT the opening of the 134th session of the General Medical Council, on Nov. 24th, Sir DONALD MACALISTER, presiding, began his address by announcing the resignation from the Council of Sir Edward Hilton Young, M.P., Crown member of the Council since 1926, and now Minister of Health and a member of the Cabinet. "He has won his distinguished position," said Sir Donald "by many eminent services to the nation, and will always be remembered by us as the first layman to be appointed to a seat on this Council where by his interest and coöperation in its work and on that of the Executive Committee, he has earned and received our grateful recognition." The President recorded also the deaths of two former members since the last meeting. Mr. George Jackson, a direct representative from 1902 to 1907, and Mr. Edward Beadon Turner, a direct representative from 1920 to 1925. He continued:—

"The Executive Committee have received from the Government Offices a number of recent Bills and Acts from the various British Dominions and Possessions, codifying or modifying their local laws respecting the practice and profession of medicine. Most of these are on familiar lines, but some indicate a growing tendency to make independent arrangements regarding reciprocity with other parts of the Empire and with foreign countries, which will ultimately limit or otherwise alter the privileges of practising hitherto granted to practitioners registered only in the Colonial and Foreign Lists of the Medical Register. The self-governing Dominions, under the Statute of Westminster, will, no doubt, in future exercise the privilege of negotiating Reciprocity Agreements of their own with foreign countries and British possessions, otherwise than through the intermediation of the United Kingdom as hitherto.

"Progress has been made in India with the promised legislation for supervising and guaranteeing the standards of Indian medical qualifications. The Government of India has now forwarded a Draft Bill to constitute an Indian Medical Council with this purpose in view. The Draft Bill has been submitted to the Executive Committee for comment, and the Committee, after consideration, has resolved that the Bill, as drafted, is designed to provide a suitable means of ascertaining and controlling such standards, and of furnishing authoritative information thereon to other countries, including the United Kingdom.

"The cycle of inspections of our own qualifying examinations in medicine, surgery, and midwifery, which has been in progress during the last two years, is nearly completed, and early next year the various official reports will be in the hands of the Examination Committee. It will be its duty, after submitting the inspectors' reports to the respective licensing bodies for remark, to present them to the Council, and to the Lord President of the Privy Council, together with a comprehensive report on the general results, and such comments and recommendations thereon as it may deem expedient."

After alluding to the inspection now proceeding of the dental examinations, which he said would be the subject of a report that might advise a revision of the curriculum, he continued:

"A report will be laid before you, in camera, from the committee appointed last session to consider certain of the standing orders which appear to require

amendment in the interest of greater efficiency and convenience. Various changes are proposed, which have been carefully framed with the invaluable assistance of our legal advisers, and will no doubt commend themselves to you for adoption, to come into force for future sessions.

"I do not propose to detail the many communications we have received during the recess from Government Departments and other public bodies, dealing with matters on which the Council's advice or assistance was desired. Many such communications you will find recorded in the minutes of the Executive Committee, to which they have been referred by the President. They show clearly the growing public confidence in the value of our opinion on questions of medical administration now accorded to it by the authorities concerned.

THE RESIGNATION OF THE PRESIDENT.

"During the summer I was unfortunately laid aside by a somewhat serious illness, and I desire to acknowledge very gratefully my indebtedness to the chairman of the business committee and others of my senior colleagues, and to the registrar, for their most generous and helpful aid in dealing with the somewhat heavy correspondence addressed to the president. Thanks to them, I have reason to believe that nothing of import has been neglected or overlooked. Since my recovery, in September, I have been able to resume my usual activities, and to make the necessary preparations for the Council's work of the session. But I find that my strength returns but slowly, and that I am less able than I was to stand the strain of continuous sittings. Desirous of observing the maxim, Ne quid detrimenti res publica capiat, I have accordingly decided, on medical advice, to ask you to relieve me of the trust you first imposed in me 27 years ago, when I was comparatively young and active. These have been years of happy and varied activity, supported and reinforced by the loyal confidence and consideration of the Council and each of its generations of members; and by their benevolent tolerance of my imperfections. I shall never be unmindful of all their personal friendliness and goodwill have meant to me. These, indeed, have made my whole period of service on the Council, now extending over 42 years, full of interest and satisfaction. I do not intend immediately to resign my place as member, but at the close of the present sitting, at the end of the business set down for to-day, I propose to resign the president's chair, in order that, if you think fit, you may elect my successor at your sitting to-morrow."

The customary vote of thanks to the President was moved by Sir Norman Walker and seconded by Sir John Moore, who said that, as the senior member of the Council, it fell to his lot to voice the feelings of all in their recognition of the President's loyalty to the Council, to the medical profession, and to the public, and their grief at the termination of his long term of office as President of the General Medical Council.

Later the President announced the election of Sir Norman Walker as his successor.

The Council then proceeded to the consideration of penal cases.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

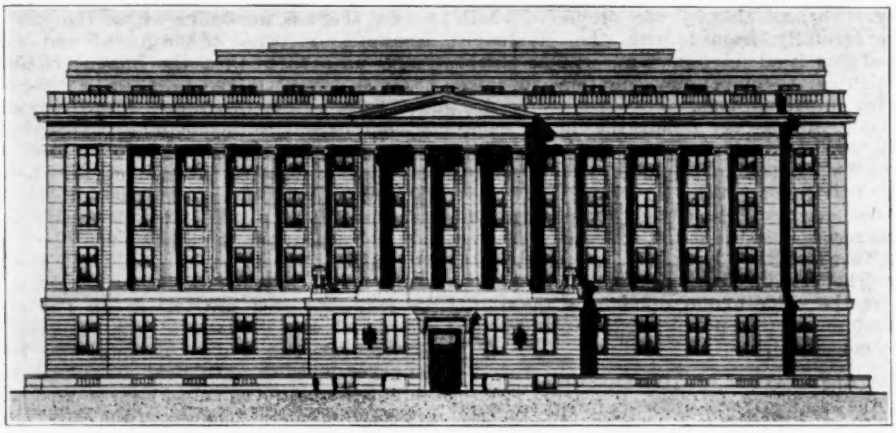
THE IRISH HOSPITALS SWEEPSTAKES.

THE draw of tickets for the fourth of the Irish hospitals sweepstakes—that for the Manchester November Handicap—was carried out in Dublin last week. So far there is no falling off in the sale of tickets, despite the vigilance of the British and certain other postal authorities. On the present occasion nearly £3,000,000 was received. Of this amount almost £2,000,000 will be distributed in prizes, and £735,463 will find its way to the hospitals. The rate-supported hospitals are now sharing, to the extent of getting one-third of the available moneys. The charitable institutions will, therefore, benefit to the extent of just under half a million. The distribution to the several charitable hospitals will be determined by the Minister for Justice, who will first have the advice of a committee of reference. The share of the rate-supported institutions on the other hand will be at the disposal of the Minister for Local Government and Public Health, who has invited the several health authorities to submit schemes to him for the improvement of their several institutions. In his speech at the opening of the drawing of tickets, Lord Powerscourt, Chairman of the Hospitals' Committee, declared that it was the hope of the Committee to carry on the sweepstakes until the hospitals had benefited to the extent of at least £12,000,000. Such a sum would be required for their proper equipment and for their future security. Including the present sweepstakes the funds made available for the hospitals since the beginning of the sweepstakes amount to nearly two million pounds.

Sweepstakes and Nursing Organisations.—A lengthy debate lately took place in the Dáil on the second reading of the Public Charitable Hospitals (No. 2) Bill, which seeks to provide that a portion of the proceeds of the sweepstakes promoted on behalf of hospitals should be applied for the benefit of charitable nursing organisations. The organisations intended to be benefited are those known as the Jubilee Nurses and the Lady Dudley Nurses, which devote themselves entirely to the nursing of the poor in their own homes in both city and country. Of late years the demand for the services of these nurses has grown out of proportion to the funds available to provide them, and there is a danger that the nurses may have to be withdrawn from certain areas in which they are badly needed. From all parts of the House there came the highest praise of the value of the work done by these nurses, a praise in which every practitioner in Ireland will agree. There was, however, some difference of opinion as to whether the nursing organisations should share in the proceeds of the sweepstakes. Mr. De Valera, leader of the Opposition, opposed the Bill on the ground that there was a definite obligation on the community to provide nursing services for the poor, and that the services should be provided from public funds and not left to charity or chance. The Bill, although a private member's Bill, received the support of the President, who declared that there was no intention of establishing a State nursing service. The debate was adjourned.

A STATE LABORATORY IN DUBLIN.

It is announced that the Rockefeller Trust has made a grant of £20,000 to the Government of the Irish Free State to assist in the erection of a State laboratory. The laboratory will be in Dublin and will be under the control of the Department of Local Government and Public Health. Advertisements for a director have already been issued. The laboratory should be of great assistance to the public health work now being organised throughout the country.



THE WELLCOME RESEARCH INSTITUTION.

THE ceremony of laying the corner-stone of the Wellcome Research Institution was performed by Lord Moynihan on Wednesday, Nov. 25th, in the presence of a large and representative company. Lord Moynihan said: "Dr. Wellcome for nearly 40 years has directed his most earnest thoughts and has bestowed his abundant gifts in order to create a great instrument for medical research, and to found a museum illustrating the significant events in medical history. His earlier labours were engaged in many directions. It was in 1894 that he founded the laboratories for physiological research, to be followed two years later by those for chemical research. When Kitchener recaptured the Sudan, Dr. Wellcome, one of the first civilians to visit that country, realised by personal contact with misery and illness in many forms that here there lay an unequalled opportunity for service. Little was then known of many of the diseases which since the birth of time had ravaged the districts then brought under British rule. In 1899 Kitchener opened laboratories built and endowed by Dr. Wellcome at Khartum for the investigation of tropical diseases. Andrew Balfour was the first director and continued his work there for twelve years. With this institute was associated a floating laboratory, towed to all the waterways of the Nile, affording opportunity for the collection of specimens, and for conduct of inquiry in areas otherwise inaccessible. It is interesting to recall that the first itinerant investigator was Dr. C. M. Wenyon, now the Director in Chief of this new Institution.

TRIBUTE TO MR. HENRY S. WELLCOME, LL.D.

"Dr. Wellcome's activities continued also in this country. In 1913 the Bureau of Scientific Research and the Historical Medical Museum were founded. In 1914 the Museum of Medical Science including Tropical Medicine, and in 1920 the Entomological Field Laboratory. The various establishments created by Dr. Wellcome have laboured under one disadvantage which every research worker will realise. They have been separate institutions, at distances often far apart, affording no easy communication between isolated workers engaged in the several departments. From to-day all is changed. This new institution is expected to house all. The Bureau of Scientific Research and the Wellcome Research Institution will be affiliated and a still closer community of interest will be fostered. There will be more accommodation for all departments and greater facilities for coöperative research. A mere enumeration of the subjects here investigated will show the necessity for this: for they include medical zoology, parasitology, chemotherapy, entomology, tropical medicine, and hygiene. The physiological and chemical research laboratories, and the Historical Museum and Museum of Modern Medicine under Dr. Daukes are also to be housed here. All this work has given Dr. Wellcome an experience unapproached by any other man, which has been freely placed at the service of others, and especially I may mention at the service of the United States when it created the Gorgas Memorial Laboratory. A conspicuous feature of all the work has been its relevance and opportunism. In the investigation of tropical diseases it began in an almost virgin field; and the harvest gathered has not only saved the lives, and restored the health, of multitudes of men, but it has made large tracts of country safe for ever for human habitation. At home the great needs of medicine to-day lie in the direction of greater opportunity for research and not less for the training of research workers. Clinical observation in medicine from Hippocrates through Sydenham and Addison to James Mackenzie has revealed many of the secrets of disease which lie within its orbit. Its conquests have been innumerable and of a value quite beyond reckoning. Upon it an ancient, virile, merciful, beneficent art was built long ago to the infinite advantage of mankind. It is within living memory that this exquisite art has found its activities enlarged and its ideals changed by the encroachment of thought and methods which are striving to convert an art into an applied science. Difficulties of course are daily encountered. Experiment brought to the aid of observation is indispensable; but hominal experiment is limited to the procedures of the operation theatre, and animal experiment is not always applicable or relevant; and may indeed even prove confusing. Meanwhile Anatomy is yielding place to Physiology. If disease is disordered function, a science of function even of comparative function must be created. Experiment has not only greatly strengthened the arm of Medicine, it has rendered its power of observation far more acute and has sharpened the tests through which the results of observations are found to be acceptable. Medicine, perhaps more than any other science, is based upon and its progress is determined by advances made in a number of affiliated sciences. Many of these will find their home in this Institute, and as our knowledge of them grows so also will the influence which each bears upon Medicine increase in strength also. Further, the clinician does not only require the aid of other sciences. He can no longer work efficiently unless he has been trained in the methods, and bred in the schools, of experimental sciences. The staffs of our teaching hospitals must be permeated by, and at last wholly composed of, those who are high priests in the religion of research, skilled in their

application to man of the methods of experimental inquiry.

It is our duty to-day to offer homage to him whose vision and whose wise beneficence has accomplished so much, and will year by year do more and more not only through original research here conducted, but by training expert workers whose severe scientific methods will be an example and an inspiration to all who are concerned with the science or the Art of Medicine."

THE BUILDING

The new building is at the corner of Gordon-street and the Euston-road, and is therefore in the immediate vicinity of University College, the London School of Tropical Medicine and Hygiene, and the headquarters of the British Medical Association. The building is of a severely classical style exteriorly, while inside it is to contain all the accommodation and amenities necessary for complete medical and research laboratories and museums. It stands on the site partly occupied before by the Bureau of Scientific Research and Museum of Medical Science associated with the Wellcome Foundation Ltd. The institution is to house the Bureau of Scientific Research, the Physiological and Chemical Research Laboratories, the Historical Medical Museum, and the Museum of Medical Science. Mr. Septimus Warwick, the architect, has already won warm approval for the design, which was exhibited this year in the Royal Academy.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 14TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 68 (last week 71); scarlet fever, 1894; diphtheria, 1031; enteric fever, 34; pneumonia, 1223; puerperal fever, 57; puerperal pyrexia, 120; cerebro-spinal fever, 27; acute poliomyelitis, 7; acute polio-encephalitis, 3; encephalitis lethargica, 15; continued fever, 1; dysentery, 26; ophthalmia neonatorum, 84. No case of cholera, plague, or typhus fever was notified during the week.

Of the 68 cases of small-pox, 27 were reported from the county of London (Lambeth 15, Bethnal Green 4, Finsbury 3, Southwark 2, Camberwell, Islington, Stepney each 1), 17 from West Ham and 20 from the county of Derby (Alfreton 8, Belper R.D. 1, Chesterfield R.D. 11).

The number of cases in the Infectious Hospitals of the London County Council on November 17th–18th was as follows: Small-pox, 133 under treatment, 1 under observation (last week 113 and 5 respectively); scarlet fever, 1731; diphtheria, 1489; enteric fever, 9; measles, 251; whooping-cough, 412; puerperal fever, 16 (plus 12 babies); encephalitis lethargica, 220; poliomyelitis, 5; "other diseases," 185. At St. Margaret's Hospital there were 10 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 24 (6) from measles, 5 (2) from scarlet fever, 26 (3) from whooping-cough, 29 (8) from diphtheria, 60 (18) from diarrhœa and enteritis under two years, and 71 (10) from influenza. The figures in parentheses are those for London itself.

Enfield and Grimsby each reported one fatal case of enteric fever. Seven deaths from measles were reported from Stoke-on-Trent, 3 from Middlesbrough, and 2 from Manchester. Liverpool reported 6 deaths from whooping-cough, Manchester 3, West Ham, Birmingham, and Newcastle-on-Tyne each 2. Diphtheria claimed 5 victims at Manchester, 3 at Liverpool. Diarrhœa was credited with 6 deaths each at Liverpool and Manchester, 3 each at Stoke-on-Trent and Birmingham.

The number of stillbirths notified during the week was 260 (corresponding to a rate of 42 per 1000 births), including 33 in London.

BOSTON HOSPITAL.—The annual report of this hospital (48 beds) states that 861 patients were admitted who cost on the average £3 8*s.* per week. There were 1533 out-patients, of whom 336 were in respect of ear, nose, and throat.

INSTITUTIONS FOR THE MENTALLY DEFECTIVE.

AT THE MONYHULL COLONY, BIRMINGHAM, there were 1204 patients at the end of March, 1931. Of these rather less than 300 were attending school on a Board of Education certificate and about 36 were attending school without a certificate. About 12·4 per cent., calculated on the average number under care, were discharged, the majority to parents and authorities. A very large amount of leave of absence was given—to 1177 adults and 357 children during the year. This leave means a great deal of administrative work to the colony, but the medical superintendent thinks that it is justified in that it keeps the patients and their friends content. There was a death-rate of 7·6 per 1000, a considerable reduction on that for the previous year. Ten cases of tuberculosis were dealt with during the year, and all showed great improvement. The principal infectious diseases were small outbreaks of mumps and influenza. The Hollymoor research laboratories have carried out a number of pathological investigations for the colony, and this work, together with good feeding and ordered life, accounts for the very satisfactory health of the patients on the whole. The commonest diseases under treatment were epilepsy and pulmonary and gastro-intestinal conditions. There is still the most acute pressure on beds, and some new accommodation was provided during the year. Full use has been made of the open-air pavilion. A dentist visited weekly and examined over 1000 colonists. The medical superintendent hopes that the committee will appoint visiting eye and ear, nose and throat specialists. On an average 400 men and 460 women were employed in the various works and workshops in the colony, and showed great interest in their tasks. Considering that most of the dangerous, violent, and troublesome female patients are employed in the laundry, the results from this department were good. Since Monyhull is a scattered institution run on the open-door system and has nearly 300 epileptic patients, there are always some absconders, and assaults on the staff and other patients occur almost daily. The number of patients who can properly be trusted without constant supervision is reflected in the number sent out on licence—six. There were several hundreds who might properly be candidates for the State institution, but every effort is made to retain them. During the year seven nurses passed the final examination of the R.M.P.A., bringing the total to 21 nurses and 30 attendants certificated or registered.

THE LANCASHIRE AND CHESHIRE SOCIETY FOR THE PERMANENT CARE OF THE FEEBLE-MINDED has had a very successful year, with comparative freedom from illness except for mild influenza. There was only one death, a youth, aged 28, who died from phthisis and cervical caries; two girls were under treatment for pulmonary tuberculosis, and one of them is steadily losing ground. There are 230 males and 144 females on the books. There are only three vacancies on the male side and the female side is full. There is a great need for increase in the accommodation, and, as usual, the difficulty is the shortage of funds. Current finances are, however, happily in a thoroughly sound condition.

KING EDWARD'S HOSPITAL FUND FOR LONDON.—A letter has been circulated to the press, above the important signatures, among others, of the Lord Chancellor, the Minister of Health, the Presidents of the Royal Colleges, and the Lord Mayor of London, pointing out that the national need for economy should on no account lead to the withdrawal of support from the metropolitan voluntary hospitals. Quotations from the recent speech at Colchester of the Prince of Wales are adduced in support of what is practically an appeal, while the sound advice is added that those who do not know in which direction to allocate their charity should consult the Distribution Committee of the Fund.

CORRESPONDENCE

PSYCHOLOGICAL ASPECTS OF SURGERY.

To the Editor of THE LANCET.

SIR,—In your issue of Nov. 21st (p. 1166) Mr. Lawrence Abel describes his American experiences, and tells how he heard about the technique of denervation of the adrenal glands and its curative effect upon soldier's heart. Can this be that "disordered action of the heart" which was responsible for the invaliding of over 80,000 men during the Great War and is now recognised as part of a psychoneurotic state? And, if it is, are we to welcome this extension of operative technique and apply it to the innumerable cases of functional heart disorder that occur in civil life, or must we join with Dr. Crookshank in lamenting the results of medicine, surgery, and gynæcology, *without* psychology? When we shall have passed through our present mechanistic phase, and psychopathology becomes part of the ordinary equipment of medicine, such operations will surely find a place among the curiosities of medical history.—I am, Sir, yours faithfully,

Queen Anne-street, W., Nov. 21st. MILLAIS CULPIN.

PSYCHOLOGICAL ASPECTS OF GYNÆCOLOGY.

To the Editor of THE LANCET.

SIR,—Dr. Fairbairn's Bradshaw lecture and Dr. Crookshank's letter in your issue of Nov. 21st were encouraging reading to those of us who are daily confronted with the futility of mechanistic or even of what one might call constitutional gynæcology.

I should like to emphasise the point that if the present state of things is to be improved more is required than a general belief on the part of gynæcologists in the significance of psychological factors and a willingness to coöperate with the psychotherapeutic specialist. The majority of women who seek treatment go to the general practitioner. Neither he nor she will be in a position to give adequate help to many of such women until not only the theory of psychology, but a psychotherapeutic technique is properly taught as an integral part of medicine, and the psychological examination is recognised as being as essential to a complete gynæcological investigation as is for instance, the bi-manual.

I am, Sir, yours faithfully,

F. MARJORY EDWARDS, M.B., B.S.

London, W., Nov. 23rd, 1931.

DENTAL CARIES AND CIVILISATION.

To the Editor of THE LANCET.

SIR,—There is a widespread belief that caries or decay of the teeth is a pathological state; that it denotes a diseased condition of the teeth, due to malnutrition, or some hidden weakness or defect of body, or lack of care of teeth. People are inclined to think that good health and strength, and normalcy of the body and its parts and functions, are accompanied by sound strong teeth. But I venture to say that in a state of civilisation it is the normal person whose teeth decay at a comparatively early age, and the abnormal person whose teeth are unaffected by decay.

Civilised man's teeth decay in accordance with a law of nature that an organ or part of the body that is in process of disuse shall break down, become atrophied or rudimentary, and finally disappear. The vermiform appendix and the male mammary glands are cases in point. Nature is the great conserver and inexorable logician. There is no further use for a part of the body; ergo, it must disappear, or remain in germ, so to speak, like the body hair of man, in case there should be use for it at some future time under changed conditions, when it will develop and grow again.

Nature then causes the teeth of civilised man to decay simply because civilised man does not need teeth to masticate the soft foods he eats. Brushing the teeth is a sanitary measure, but it cannot save teeth from decay. Negroes who never clean their teeth have sound teeth as have animals. The English, who have eaten soft foods for centuries, have notoriously poor teeth. Though the decay of teeth is a normal process, dentists are necessary to prevent infection, preserve the appearance of teeth, and save our teeth for the occasional hard foods we eat.

But let no one think that this degenerative process that takes place in teeth betokens any weakness of constitution, or that civilisation itself degenerates the body. The civilised man is far more adaptable to various environments and conditions than the savage is. He is immune to diseases that kill the savage, and survives diseases, climates, and hardships that overcome the savage.

I am, Sir, yours faithfully,

CHARLES HOOPER.

Cœur d'Alene, Idaho, U.S.A., Oct. 27th, 1931.

CANCER OF THE CERVIX.

To the Editor of THE LANCET.

SIR,—The letter of Mr. Wilfred Shaw in your last issue contains so many arguments in favour of the view put forward by your reviewer concerning the relative frequency of columnar-celled cancer of the cervix and squamous epithelioma that the latter might well look on his views as receiving considerable support from them. The occurrence of squamous metaplasia in adenocarcinomata of the body of the uterus, and its frequency in the normal columnar epithelium in the region of the external os, might provide a strong basis of support for the occurrence of a similar metaplastic change in the columnar-celled cancer of the cervix. That such a change does readily occur in the cells of a columnar cancer of the cervix so that they become of "squamoid" type, though not true squamous cells, is probably the cause, in part at least, of what your reviewer regards as a common error.

Before proceeding further it is essential to define exactly what we mean by the term "squamous epithelioma." It is obviously not sufficient to define it as a cancer derived from squamous epithelium, as the basal layer of the latter may give rise to a basal cell carcinoma that is not a squamous epithelioma. Neither are epithelial pearls necessary, as it is well known that these are rarely present in the squamous epithelioma of the cervix or vagina, probably because in these regions the keratin layer is normally but poorly marked. The presence of spinous cells however is essential. They are absent in the basal cell cancer and from the "squamoid" cells derived from metaplasia of the columnar-celled carcinoma. Therefore the contention of Mr. Shaw that "most of the very early carcinomata of the cervix that one sees can be demonstrated to arise from the squamous epithelium of the portio," cannot be regarded as proof that the resultant growth is a

squamous epithelioma, unless its origin has been traced to the layers superficial to the basal layer—viz., the prickle layer, in which case the spinous cells will be reproduced and can be found if carefully sought.

It is unfortunate that it is only on rare occasions that a cancer of the cervix is discovered sufficiently early to allow its origin to be demonstrated with accuracy, but if the above considerations are kept in mind the nature of the growth, whether columnar-celled or squamous epithelioma, can be determined after careful examination. This will in my opinion reveal that the frequency in any series of cases taken at random will be somewhat as follows :—

(1) The majority will be solid alveolar cancers, composed primarily of columnar cells with a marked tendency to metaplasia into cells of squamoid type but without spines. These arise mostly from the cervical glands but they may also arise from the basal cell layer. They form, not alveoli, but solid finger-like processes that ultimately entirely replace the stroma. In early cases these solid processes can be readily found to originate in the cervical glands, and to spread therefrom into the surrounding stroma. There may be apparently normal glands adjacent.
(2) A certain number will be true squamous epitheliomata, usually with no cell nest formation. The cells will however show prickles, less well marked, it is true, than in healthy squamous epithelium, but nevertheless evident on careful examination.
(3) Very few will be adenocarcinomata with typical alveolar structure. In my experience these arise in the new gland formation of a follicular "erosion."

If your reviewer's classification is accepted it may go far to explain the highly malignant nature of the great majority of cervical cancers, for it is generally true that malignancy varies directly with the amount of anaplasia.

All will agree with Mr. Shaw that it is undesirable to inflict more controversial matter upon the student but once we are all agreed on the truth the matter will cease to be controversial.

I am, Sir, yours faithfully,

London, W.C., Nov. 23rd, 1931. F. J. BROWNE.

PSYCHOLOGICAL CLINICS FOR CHILDREN.

To the Editor of THE LANCET.

SIR,—If Dr. William Moodie will read again the letter (THE LANCET, Nov. 7th, p. 1046) which he challenges in your issue of Nov. 21st (p. 1160), he will find that it does not state that in "Child Guidance by Team Work" the "view is expressed that the Child Guidance Council limits the field of its activities in psychological medicine to behaviour disorders of children and juvenile delinquency." What it does say is that we (the National Institute of Child Psychology) were interested by THE LANCET'S "limitation of the field of psychological medicine in its relation to children to behaviour disorders and juvenile delinquency" (Oct. 24th); and that "this is *in line with* the view of the Child Guidance Council as expressed in their official pamphlet."

As to this the official definition of the aim and purpose of the Child Guidance Council, quoted from Dr. Moodie's own pamphlet, runs :—

"*The Meaning of Child Guidance.*—Child Guidance is concerned with the elucidation of behaviour problems in children.
What is a Behaviour Problem?—A child can be considered to present a behaviour problem only when, given average home and school conditions, average discipline, and average physical care, its behaviour fails to conform to that of the average child of similar age."

These quotations, taken from page 1 of "Child Guidance by Team Work" contain the *only* definition of the aims and objects of the Child Guidance Council to be found between its covers. The remaining pages contain three sections (The Team; Treatment; and Special Treatment), and a note on Type of Patient Accepted, and another on Teaching. In the latter there occurs the following sentence :

"The type of problem accepted is extremely wide, but children suffering from definite organic diseases, *definite mental diseases such as epilepsy*, and from mental defect, are not treated."

It is difficult to understand how Dr. Moodie reads into the statement of problems included in the field covered by the work of the National Institute of Child Psychology an implication that "the treatment of minor physical ailments and psychoneurosis of childhood is neglected" by the Child Guidance Council. The offending sentence was designed to show that the field covered by the N.I.C.P. is not limited by the behaviour problems which it is the aim and purpose of the Child Guidance Council (vide their pamphlet) to elucidate.

We do, for example, accept for treatment cases primarily referred for certain minor chronic diseases, such as debility, failure to gain in weight, headache, and chronic catarrh, as well as epilepsy (Dr. Moodie's definition of epilepsy as "a definite mental disease" is surely not in line with modern thought?) and asthma.—I am, Sir, yours faithfully,

MARGARET F. LOWENFELD,
Hon. Medical Director, National Institute of Child Psychology.
19, Warwick-crescent, W., Nov. 23rd, 1931.

ANÆSTHETISTS IN THE UNIT SYSTEM.

To the Editor of THE LANCET.

SIR,—Dr. Howard Jones's letter has struck the right note in the teaching of anæsthesia. This branch of medical science appears to receive too little attention at the medical schools. Newly qualified men taking up appointments as residents arrive with two great theories: (1) that chloroform is a dangerous anæsthetic; (2) that ether is safe. They then proceed to pour ether on an open mask until analgesia is brought about. After a time they become aware of the surgeon's impatience at the length of time taken for induction, so they take their courage in their hands and use increasing quantities of chloroform for induction. The gas and oxygen apparatus is looked upon as a complicated piece of machinery needing the care of a practised hand, and it is consequently shunned like the plague.

If anæsthesia were given its proper status in the surgical unit, this dangerous, antiquated, and wasteful method would not be perpetuated, and the student would begin to realise that anæsthesia is a most interesting subject both to himself, the surgeon, *and* the patient.—I am, Sir, yours faithfully,

R. H. MORTIS,
Nov. 20th. Hon. Anæsthetist, Hertford County Hospital.

To the Editor of THE LANCET.

SIR,—The letter of Dr. Howard Jones and your comment thereon deal with a problem of anæsthetic organisation which is certainly in urgent need of sympathetic solution. It is one, however, which affects a relatively small number and which really forms part of a much larger problem—namely, the future of anæsthesia as a specialty in this country.

The conditions under which anæsthetic work is carried on have changed considerably during recent years, and the effects of these changes are being especially felt at the present time. The greater demands made by hospitals individually, the multiplication of hospital appointments by both surgeons and anæsthetists, and the provision of pay beds in hospitals, are some of the factors concerned, but others could easily be cited. In the result the anæsthetist's

position is becoming more and more insecure, although the amount of routine work undertaken has never been greater. While in other countries the professed aim is to increase the number and efficiency of specialists in the subject, the tendency in this country is at the moment in precisely the opposite direction. That this is realised by the younger men is shown in the difficulty now found in filling the junior hospital appointments devoted entirely or mainly to anæsthetic work. It would indeed in my opinion be unfair to encourage promising students to devote themselves to this specialty as long as the prospects remain so precarious.

What is wanted is the development of a policy which shall overcome this difficulty and at the same time provide (1) an efficient anæsthetic service for hospital work, (2) an improved standard of teaching, and (3) facilities for adequate scientific investigation of new drugs and methods.

I am, Sir, yours faithfully,

London, W., Nov. 23rd, 1931. H. N. WEBBER.

RESEARCH IN ASTHMA.

To the Editor of THE LANCET.

SIR,—I believe that the claims made in a leading article last week under this heading concerning Dr. Oriel's proteose cannot be justified. They are made, I feel sure, on the authority of the Asthma Research Council's "Report of Progress from June 1st, 1930, to Oct. 31st, 1931." I am on the Medical Advisory Committee, but the reports are not submitted to us.

The crux of the matter lies in the alleged *specific* dermal reaction of Oriel's proteose; with this his work is of the greatest possible importance to immunology, but without it the work loses all significance. During the past year I have done the following:

1. I first tried to make this proteose in my own laboratory. I had to guide me, Dr. Oriel's original paper and his typewritten supplementary instructions. There seemed to be as much "proteose" from my own and from my assistants' urine as from that of asthmatic patients, so I got Oriel to come for criticism and help. He said these previous directions were inadequate, and very kindly gave me additional advice. Even so I still got the same heterodox results and was unable to produce a substance from an asthmatic's urine which gave a specific dermal reaction on that patient.

2. I got Dr. Roche Lynch at St. Mary's to try to prepare proteose with the help of Dr. Oriel's supplementary instructions, but nothing was produced which showed a specific reaction on the patients in question.

3. I sent urine from one of my out-patients at St. Mary's to Dr. Oriel's laboratory; he prepared and sent back the proteose, but it gave no specific reaction.

4. Dr. Oriel said that possibly a patient's urine yielded the proteose at one time and not at another, so I arranged with him that I would take into our research wards at St. Mary's first one bad case of asthma and eczema, and then, a month later, a second case of the same type; both cases were seen by Dr. Oriel and pronounced most suitable. I sent down daily specimens of urine to his laboratory covering periods of exacerbation and remission of the symptoms. Dr. Oriel sent me one specimen of proteose from the first case and two specimens (at about a week's interval) from the second. None of them gave a specific reaction. I offered to go on sending any amount of daily specimens from these cases, but I understood Dr. Oriel to say that it was not worth trying any more.

5. *This* is most convincing of all to me: Dr. Oriel gave me proteose he had isolated from hay-fever urine; this was said to give specific dermal reactions in 80 per cent. of all true hay-fever cases. I found it quite non-specific on all cases tested.

6. I suggested several times that his proteose should be the topic of debate in the Asthma Research Club, but Dr. Oriel laughingly cried off. In consequence of this I really thought that the specific action claim had been given up.

It is clear from the above that Dr. Oriel has given every help in his power to the settling of my doubts; but it will be clear also why I think the statement quoted in your leading article is unproven.

I am, Sir, yours faithfully,

Devonshire-place, W., Nov. 23rd. JOHN FREEMAN.

DARWIN'S NAVAL SERVICE.

To the Editor of THE LANCET.

SIR,—In the Naval Medical Service section of your Students' Number, August 29th (p. 482), mention is made of "the great Naval Surgeons of the past, such as Darwin, Huxley, and many others, who have contributed so much to science." As far as Huxley is concerned this is correct, for he was appointed assistant surgeon to H.M.S. *Rattlesnake*, though he had no medical and surgical diploma, and went in that vessel under Captain Owen Smyth on an exploring expedition to New Guinea. Darwin, however, was never a naval surgeon; two years' medical study at Edinburgh only gave him a distaste for the profession, so he never attempted to qualify himself or to practise it. He was appointed to H.M.S. *Beagle* rather as a guest of Captain Fitz-Roy, who was anxious to have such a man as naturalist and expert in science. This was approved by the Admiralty. All the details may be found in the "Life of Chas. Darwin," and in his ever-fresh "Voyage of a Naturalist Round the World."

I am, Sir, yours faithfully,

F. LUCAS BENHAM, M.D., M.R.C.P.

Semaphore, S. Australia, Oct. 13th, 1931.

RADIUM BY MOUTH OR INJECTION.

To the Editor of THE LANCET.

SIR,—In your issue of Nov. 7th (p. 1013) Dr. N. Mutch has shown how small doses of radium have a favourable effect on high blood pressure uncomplicated by kidney trouble. In discussing the general properties of radium and radium emanation he stated that "Radium, like lead, is a cumulative poison, which collects in the tissues and is slowly excreted by the bowel." This point was followed up by Dr. A. T. Todd in your issue of Nov. 14th (p. 1101), and I would like to add a further reference to a disease occurring in certain mines in Saxony and Bohemia, which seems to me to have an important bearing on the subject of the therapeutic administration of radium and its emanation.

Dr. Ernst W. Baader[1] has recently published a small book on industrial diseases which are notifiable in Germany, and among these is the so-called Schneeberg disease. Schneeberg is a small mining town in Saxony, on the northern slopes of the Erzgebirge, where, along with various metalliferous ores (cobalt, &c.), uranium pitchblende is mined for its radium. There are similar mines at Joachimstal, in Bohemia, on the southern slopes of the same range. In both these mines a considerable percentage of the miners suffer from "pulmonary tumour" super-

[1] "Gewerbekrankheiten" (Industrial Diseases), p. 124, Urban and Schwarzenberg. 1931.

imposed on a pneumokoniosis. The tumour (in the case of Joachimstal) has recently (1929) been shown to be carcinomatous, and develops in the large bronchi. And further, it is now recognised that the Schneeberg disease is of the same nature.

At first the arsenic, the content of which in the ores may reach as much as 0·45 per cent., was looked upon as the cause of the carcinoma, but as pulmonary tumours did not appear to be common in other arsenical mines the radium came under suspicion. The amount of radium emanation in the air and water of these mines is 50 and 70 maché units per litre respectively, and is very much below the therapeutic doses, while the radium in the pitchblende must be infinitesimal, but the miners are in contact with these some 20 to 30 years before the fatal tumour develops. This may occur at the end of the thirties, but mostly takes place between the fourtieth and fiftieth year of life. Dr. Baader concludes his report with the statement: "I have visited both places" (Schneeberg and Joachimstal) "and look upon radium as the main cause of the carcinoma of the lung."

I am, Sir, yours faithfully,

London, S.E., Nov. 23rd, 1931. R. KING BROWN.

THE MEDICAL REGISTER: OFFICE EDITION.

To the Editor of THE LANCET.

SIR,—May I remind those who find it essential to know whether a practitioner is legally qualified or not that, in order to facilitate their work, the General Medical Council publishes an office edition of the Medical Register, printed on inexpensive paper and bound in boards, but containing precisely the same names and lists as the more expensive edition. It is issued from this office at a special charge of 10*s.* post free, but no copies can be supplied unless they are ordered and paid for before Dec. 31st. The Council also issues each month a list of additions to and deletions from the Register, the charge for which will be furnished upon application.

I am, Sir, yours faithfully,

NORMAN C. KING,
Registrar, General Medical Council.

44, Hallam-street, Portland-place, W., Nov. 20th, 1931.

MEASLES IS PREVENTABLE.

To the Editor of THE LANCET.

SIR,—The efficacy of convalescent serum in preventing or modifying measles in susceptible individuals exposed to infection is established beyond dispute. To deny this would be to refute the findings of all those who have employed this method of serum prophylaxis since its introduction in 1916 by Nicolle and Conseil, and their verdict has been unanimous: measles can be prevented. In view of this it seems to me that when Dr. Duncan Forbes states in his letter in your issue of Nov. 21st that measles is "almost wholly unpreventable" he is confusing "unpreventable" with "ineradicable"; to be able to prevent a disease is one thing, to stamp it out quite another matter. The fact that one advises giving the serum late in the incubation period in certain cases with the object of modifying the attack rather than preventing it, is no admission that measles is unpreventable. It is merely recognising the impossibility at the present time of eradicating measles from the community, and the necessity therefore of allowing the individual, whenever possible, to acquire a solid immunity. Whether the attitude of the leader in the *Times* was due to the misuse of the word "unpreventable" or to an ignorance of the facts I cannot say, but it was none the less regrettable, for it gave the layman the impression that there was nothing that could be done to prevent or mitigate the disease in the individual. All those who have witnessed the almost miraculous efficacy of convalescent serum wish to see this method of serum prophylaxis universally applied, and this end will be more rapidly attained if both the medical officer and the layman are correctly informed on the matter. For this reason I deplore Dr. Forbes's attitude and the impression conveyed by the leading article in the *Times*.—I am, Sir, yours faithfully,

Freedom Research Laboratory, London Hospital, E., Nov. 23rd, 1931. S. P. BEDSON.

ALBUMINURIA IN PREGNANCY.

To the Editor of THE LANCET.

SIR,—Since my paper on albuminuria complicating pregnancy appeared in THE LANCET there have been several references to it in your journal.

Dr. A. A. Osman (Sept. 26th, p. 714) was kind enough to criticise the treatment that I have adopted, and I am glad to have the support of such an authority in my advocacy of absolute rest, and also in his acceptance of my plea for early induction of labour. He finds fault however with my low protein diet, first, because I have not produced evidence that a high protein diet is harmful, and secondly, because he thinks an adequate supply of protein is necessary to replace that lost in the urine. I am aware that diets high in protein have been advocated in the treatment of renal disease, but I have not been encouraged to use them for the following reasons. On theoretical grounds it has always seemed to me that any excess of protein metabolism over the minimum basal requirements of the body must involve extra work for the kidneys, and where we are dealing with a disease of such relatively acute type as occurs in pregnancy, I believe that physiological rest is all-important. In actual practice I have observed an increase in the amount of albumin in the urine, and a rise in the blood pressure, following upon an increase in the protein intake. For these reasons it has seemed to me right to diminish the protein in the diet to a minimum.

Your leader writer (Oct. 31st, p. 969) asks what is the ultimate fate of the patients that I have labelled "chronic nephritis" and "occult nephritis." I am quite sure that the patients with chronic nephritis will ultimately die from the disease, since they have all the clinical appearances of chronic Bright's disease due to other causes. The patients with occult nephritis I have yet to trace to the end. I have already observed cases where an occult nephritis has ultimately become a patent chronic nephritis, so that I expect to find that the difference in these two groups is one of degree only. But this is merely a prophesy.

Dr. G. W. Theobald (Nov. 21st, p. 1156) asks me to forgive him for prophesying that my patients with occult nephritis have in fact no permanent renal lesion. I am willing to do so, but at the same time I must state the I disagree with him. I am satisfied that 10 per cent. of previously healthy women develop gross chronic kidney damage as the result of a pregnancy toxæmia. I find no difficulty in believing that 50 per cent. develop damage of a similar nature, but in a less marked degree, and the fact that I can favourably influence the incidence of recurrent albuminuria, by early induction during the first toxæmia, is to my mind strong evidence that the underlying cause of the recurrence is an occult nephritis caused by the first toxæmic pregnancy.

I have always been careful to avoid any expression of opinion as to the cause of albuminuria of pregnancy, and when I have used the term "toxæmia" I have

done so merely to describe a well-recognised clinical condition. My research has aimed at determining the late results of this condition, and I hold that my conclusions are valid whatever theories may be held as to the ultimate cause of "pregnancy toxæmia." I am not prepared therefore to discuss the importance of Dr. Theobald's investigations into the *cause* of the disease, since to avoid confusion and side-issues I have in my published work, kept strictly to the investigation of the *results*. When I state that pregnancy is the most delicate test of renal function that we possess, I merely mean that it is the only way of demonstrating any abnormal physical signs in the mildest cases of occult nephritis. Whether this test depends upon a toxin, or merely upon a pressure effect, I am not prepared to say.

Your annotation (Nov. 14th, p. 1092) on the work of Peckham and Stout states that their findings support my own conclusions. There are differences, the most striking of which is that they find chronic nephritis develop in a third of their toxæmic patients, whereas I find it in only one-tenth. I feel sure that this difference is largely due to the fact that our standards of chronic nephritis have been so different. They have, for example, labelled as chronic nephritis a patient in whom the only abnormal physical sign was a systolic blood pressure of 150 mm. I have never been so bold, and have reserved the term chronic nephritis for such cases as any physician would accept without hesitation. Further comparison of their results with my own is very difficult, since they have adopted the classification of Stander and Peckham—a classification which I must confess I have never been able to understand. I am the first to pay tribute to the valuable work that has come from the Johns Hopkins Hospital on this subject, but at the same time I feel that the classification they have adopted, if it spreads further afield than their own hospital, will merely obscure the issue.

I am, Sir, yours faithfully,

Queen Anne-street, W., Nov. 24th, G. F. GIBBERD.

MEASUREMENT OF DEAFNESS IN SCHOOL-CHILDREN

To the Editor of THE LANCET.

SIR,—While the method of measuring deafness mentioned in your note on p. 1168 is one of considerable value, I would like to point out two objections which are of importance in its application. The tests employed are by spoken numbers. Now the examination of hearing by spoken numbers is valueless, because the names of numbers are too few and the ear of the patient is familiarised with them from childhood, so that, accustomed to this very limited series of words, he guesses rather than hears. This is a hearing more mental than organic and is consequently not true hearing. Short words and sentences would give a much more reliable result, and would eliminate the play of intelligence and mental hearing as substitutes for acoustic non-perception. The question is fully debated in my manual of the Electrophonoïde Method of Zünd-Burguet (Heinemann, 1927, p. 59).

The second point, of less importance (although a very practical objection), is the taking of the audiometric examination without a preliminary physical examination of the ears. Many months ago I was consulted by a patient who brought with him a chart taken by the audiometer. The chart showed a high degree of deafness, and the patient was much alarmed. The removal of large plugs of cerumen completely relieved his deafness.—I am, Sir, yours faithfully,

Harley-street, W., Nov. 22nd, MACLEOD YEARSLEY.

THE LÜBECK TRIAL.

(FROM OUR BERLIN CORRESPONDENT.)

(*Continued from p. 1160.*)

Dr. Mögling, on re-examination, said he was not sure whether in all cases examined by him the cause of death was feeding with tuberculous material. A report of an address read before the Lübeck Medical Society with the object of inducing practitioners to apply the Calmette method was then produced in court. In this address Dr. Jannasch had said that in the future when tuberculosis had decreased in Lübeck it would be counted as a merit to the medical profession that they had agreed to the introduction of the Calmette method. Dr. Schmincke suggested that its introduction was meant to combat tuberculosis in a less expensive way than by hygienic measures.

A group of Lübeck medical men were then examined to ascertain at what moment the accused had become aware that something was wrong with the B C G. A mother gave evidence that when her child had become ill in March, 1930, she had asked a woman doctor whether the ailment (whose cause was then unknown) might not have been the result of the application of the B C G; the doctor replied she was not of that opinion. On April 26th the mother was requested to have her child examined on behalf of the Municipal Health Office on account of undesirable symptoms in some other children. When she told her doctor this, the latter remarked she was glad that the Health Office was at last dealing with the matter as Lübeck practitioners had long noticed that children were becoming ill after having B C G vaccine. Another mother gave evidence that her infant in mid-April had shown marked swelling of the cervical glands, when Prof. Klotz had assured her that it was a severe chill, possibly influenza. Asked by Prof. Lange why he had not been surprised that nearly all the children vaccinated with B C G showed the same symptoms after four weeks, Prof. Klotz answered that the spring was the high season in a children's hospital, and that swelling of glands and bronchitis were always very frequent at that time. A father reported that when he had heard in the city that the B C G had made some children ill he had tried to interview the leading physicians of the hospital, but they had always declined to see the parents, sending in their stead one of their assistants. Dr. Wiener, one of the latter, asked by counsel to the parents whether it was contrary to medical ethics to criticise professional brethren and whether he had been instructed to conceal facts connected with the application of the B C G method, answered that he had not been so instructed; one of the physicians however had told him that a portion of the compound was spoiled. He did not remember whether it was Prof. Deycke or Dr. Altstädt.

Some sensation was then caused by the prosecutor stating that the records of the cases had been altered by cancelling certain words. He produced a record where the diagnosis "tuberculosis by Calmette treatment" was erased and "pulmonary tuberculosis" substituted. Dr. Wiener said he had not made any alteration in the records nor had he been instructed to do so. A father said that a nurse of the hospital had told him that the nurses knew from mid-April on that the children became ill from the application of the B C G. When they discussed it amongst themselves they were warned by the head nurse that if they did not abstain from talking such nonsense they would be discharged.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

PARLIAMENTARY MEDICAL COMMITTEE.

On Wednesday, Nov. 18th, the first meeting of the Parliamentary Medical Committee since the General Election was held at the House of Commons. Lieut.-Colonel FREMANTLE was elected chairman, Dr. SALTER vice-chairman, Dr. MORRIS-JONES treasurer, and Dr. HOWITT, Secretary. Lieut.-Colonel Fremantle succeeds Dr. Salter as Chairman in accordance with the custom that the chairman of the Committee shall belong to the largest party in the House.

ABNORMAL IMPORTATIONS BILL.

On Wednesday, Nov. 18th, the Abnormal Importations (Customs Duties) Bill was read a second time by 376 votes to 47. The Bill passed through its remaining stages on the following day, Nov. 19th, and was read the third time by 329 votes to 44. On Friday, Nov. 20th, the Bill received Royal Assent.

PROLONGATION OF INSURANCE.

In the House of Commons on Thursday, Nov. 19th, the following financial resolution connected with the National Health Insurance (Prolongation of Insurance) Bill was agreed to in Committee :—

"That it is expedient: (*a*) to amend the subsection substituted by the National Health Insurance Act, 1928 (hereinafter referred to as "the Act of 1928"), for Subsection (3) of Section 3 of the National Health Insurance Act, 1924 (hereinafter referred to as "the Act of 1924"), by providing that a person who has, under the said substituted subsection, or under that subsection as applied by the regulations made under Section 23 of the Act of 1928, or as amended by Section 1 of the National Health Insurance (Prolongation of Insurance) Act, 1930, been treated as an employed contributor insured under the Act of 1924, shall continue to be so treated until Dec. 31st, 1932, if he satisfies the condition contained in paragraph (*a*) of the said subsection, and also the following condition, that is to say, if he proves within the prescribed time that throughout the period during which he was by virtue of the said substituted subsection, or of that subsection as so applied or amended as aforesaid, treated as an employed contributor insured under the Act of 1924, he was at all times when not employed within the meaning of the Act of 1924 either available for but unable to obtain employment within the meaning of the Act of 1924, or incapable of work by reason of some specific disease or bodily or mental disablement of which notice was given within the prescribed time; (*b*) to authorise the payment out of moneys provided by Parliament—(1) of a sum equal to 36 contributions (at the rate of 9*d*. in the case of a man and 8½*d*. in the case of a woman) in respect of every person to whom this resolution applies, such sum to be paid or credited to the fund or account out of which the benefits to which that person is entitled are defrayed; and (2) of the additional cost of benefits under the Act of 1924, and the expenses of administration of those benefits (so far as such cost and expenses are payable out of moneys provided by Parliament) consequent on the provisions of paragraph (*a*) of this resolution."

FACTORY ADMINISTRATION—THE TWO-SHIFT SYSTEM.

On Monday, Nov. 23rd, the House of Commons went into Committee on the Expiring Laws Bill. Sir DENNIS HERBERT, Chairman of Committees, was in the chair.

On the Second Schedule,

Mr. RHYS DAVIES moved an amendment to delete from the Bill Section 2 of the Employment of Women, Young Persons and Women Act, 1920, which makes it lawful, subject to conditions prescribed by the Secretary of State, at any time between six in the morning and ten in the evening on any week-day, other than Saturday, to employ women and young persons in shifts, averaging not more than eight hours per day. He said that the two-shift system came into existence during the war, and it was extraordinary that war conditions should still be allowed to persist in 1931. The Industrial Fatigue Research Board in a report dated February, 1928, stated that—

"While day workers in specified factories lost 4·4 per cent. of their time, shift workers lost 6·5 per cent., and that there were more cases of faintness and disorders of the digestive organs among shift workers than among day-workers."

The Committee ought to have some regard for the opinions of experts—sociologists and medical men—on this very important subject. He also objected to the system because it was abused by employers. The last annual report of the Chief Inspector of Factories furnished sufficient proof.

FATIGUE AND ENDURANCE.

Miss PICKFORD said that this subject of the conditions and hours of employment of women and young persons particularly interested her, because she served as a temporary inspector under the Home Office and had had ample opportunity of seeing the working of the two-shift system. Although it was possible for a short time to increase output, it was quite clear that long hours could not be carried on for weeks and months, or even for years, without defeating their own ends. It soon became clear that the limits of endurance of the workers had been reached, and that the normal period permitted under the Act, 12 hours, when extended to 14 and 16 hours, resulted not in an increase but in a diminution of output. Experiments and researches were carried out by the officers of the Ministry of Munitions, and also by the inspectors of the factories, to discover what was the best method of getting the maximum output with the minimum of fatigue for the workers. Those experiments had been continued since by the Industrial Fatigue Research Board. They had shown quite conclusively that a day of eight or nine hours produced better results than a day of 12 hours, and that two shifts of from seven to eight hours gave a better output than a long shift of from 12 to 14 hours, or extended even to 16. For extended processes three eight-hour shifts were better than two 12-hour shifts. Furthermore, the incidence of accidents was always greater towards the end of a long period of employment, when due to fatigue and overstrain the attention of the worker was apt to wander. The only way to bring down the cost of production without injury to the workers was to make the fullest and most scientific use of the machinery. That could only be done by the shift system which, she contended, was a far better and more humane and more economic system of working than going back to a long day of 16 hours. If the Labour Party wanted to go back to the bad old days she did not. She thought that the National Government, after having brought the fiscal system of the country up-to-date, would be failing in its duty if it neglected to bring up-to-date the factory and workshop legislation which protected thousands of workers and regulated their lives. The time was ripe for a consolidating and amending Act, and such an Act should be passed within the lifetime of the present Parliament. Until, however, such an Act could be passed it would be necessary year by year to renew this provision for women and young children to work under the shift system.

HOME OFFICE VIEW.

After further debate,

Mr. OLIVER STANLEY (Under-Secretary for the Home Office) said that it was obvious that the Labour Party, like the Bourbons, were unteachable, and that despite the lessons of the past few months they intended once again to follow the practice of denouncing in Opposition that which they continued when in office. Mr. Clynes and Mr. Short had both defended the two-shift system in 1929 and 1930, and no one could pretend that the industrial emergency which they feared in those years was any less to-day. In

two and a half years the Labour Government passed 200 two-shift Orders, and did not pass any Factory Bill. No official complaint on this subject had been received at the Home Office, and it appeared that these Orders still continued to receive the assent of the workers when they were put into operation. The point made by Mr. Rhys Davies regarding sickness arising under this two-shift system was not a very substantial one. As the hon. Member had quoted from the report of the Industrial Fatigue Research Board, he (Mr. Stanley) would supplement that quotation with the following which was also taken from the report:—

"No conclusive statistical evidence has been found of a greater amount of sickness on one system than the other. . . . When the statistics were grouped by departments it appeared that the total sickness of the departments on shift work was exactly the same as that of the departments on day work."

The Government could not accept this amendment, which would work not for the benefit but for the disadvantage of the persons concerned, and would jeopardise the employment of at least 40,000 people.

The amendment was rejected by 373 votes to 33.

HOUSING POLICY.

Mr. MAXTON moved an amendment the purpose of which was to withdraw from the owners of houses the right under the Rent Restriction Acts, 1920, to charge 40 per cent. increased rent. He said that he had steadily held that those increases of rent were unjustifiable. Most of the houses affected were old houses, and the capital invested in them had been returned to the investors over and over again. With reduced unemployment benefit, with means tests and people cut out of benefit altogether, the position of many people to-day was very bad. No more pitiable spectacle was to be seen in the whole of our social economy than the hundreds of women attending the courts in Glasgow with their babies in their arms struggling against the power of the law to maintain a roof over their heads. If hon. Members could see some of the houses which those women were struggling to maintain, and from which they were in terror of being evicted, they would realise to what depths human beings could fall in the existing social order.

WANTED A CONSTRUCTIVE POLICY.

Lord EUSTACE PERCY appealed to Mr. Maxton to demand from the Government in due course a constructive housing policy covering the whole area of rents, a policy which would deal with the chief evils of the situation. What the poorer people wanted was a constructive building policy for the provision of new houses, and not merely a policy which would give them security of tenure in their present slums at a slightly lower rent. The greatest influence for the perpetuation of slums had been the Rent Restriction Acts.

After further debate,

Sir E. HILTON YOUNG (Minister of Health) said that a general debate on housing policy at this moment would be premature, because more time was needed for considering this problem in the light of changed events. He accepted freely the appeal that had been made that the Government should give reconsideration to the whole of the housing problem, and restate the broadest principles of housing policy. The Government were considering this matter, and would come to conclusions upon it. It was recognised that there was information now available that all was not well with our housing policy in one respect—namely, that it had failed to provide an adequate supply of the lower class of houses to let for the wage-earners. In the second place, it was also recognised that owing to current financial conditions, if never before, it was now absolutely imperative that they should get full value from the point of view of social development for every penny of public money that they spent upon houses. The Government would certainly respond to another appeal that had been made—namely, that they should not consider this problem in any light of class interest. They would consider it in the single light of the interests of the whole community, and a fair deal for the landlord and for the tenant. The Government could not accept this amendment which would reduce the whole of the legislation on rent restriction to chaos, and cause intolerable hardship upon a large class, particularly those who were mortgage owners.

The amendment was rejected by 311 votes to 40.

The Bill passed through Committee and was read the third time.

HOUSE OF COMMONS.

THURSDAY, NOV. 19TH.

Housing Schemes.

Sir JOSEPH NALL asked the Minister of Health the present position regarding the housing schemes of the corporation of Manchester; and whether his department would continue to require the city council to build only the types of houses for which the greatest demand existed.—Sir E. HILTON YOUNG replied: The Corporation of Manchester have recently submitted proposals for the building of over 2000 houses many of which are of a larger size than I think is required. The Corporation have been asked to revise their proposals so that the bulk of the houses to be provided can be let at a lower rent than has been usual in the city for Corporation houses and I am in communication with them on the subject.

Major MILNER asked the Minister of Health the number of housing schemes which had been suspended or retarded following the suggestions to local authorities that all expenditure should be reduced to a minimum; and the number of persons who would have been employed had the various housing schemes been continued.—Sir E. HILTON YOUNG replied: I have only been informed of nine cases covering quite a small number of houses in which any definite action has been taken by the local authority to curtail or suspend their housing programme. The hon. Member will see from a copy of a Circular which I am sending to him that he is under a misapprehension in stating that it has been suggested to local authorities that all expenditure should be reduced to a minimum irrespective of its character or purpose.

Panel Practitioners and their Patients.

Mr. RHYS DAVIES asked the Minister of Health the changes proposed in the relationship between doctors and their panel patients; whether any regulations covering those new relationships were to be laid upon the Table of this House and subject to the usual practice; and why the approved societies had not been consulted on these changes.—Sir E. HILTON YOUNG replied: Regulations making minor amendments in the Medical Benefit Regulations will shortly be published in draft and will be laid before Parliament in due course. I do not think it will be found that the Regulations materially affect existing relations between insurance doctors and their patients; and the third part of the question does not, therefore, arise.

Mr. RHYS DAVIES: Is it not the custom of the Ministry of Health to consult the Consultative Committee of the Ministry in regard to health insurance administration, and why has not the Committee been consulted this time.—Sir E. HILTON YOUNG: The hon. Member is rather anticipating the event. I would ask him to await consideration by the House of the regulations and then see whether there is any necessity for the question he now asks.

Disability Pensions and Relief.

Captain STRICKLAND asked the Minister of Health whether, seeing that the disability pensions of ex-Service men were granted in view of definite injury received incapacitating the recipients in competition for employment and that that handicap was recognised by the references contained in the circulars issued by the Ministers of Health and Labour dated Oct. 8th and Nov. 11th, he would seek power to have the duties laid down by the Order in Council so altered that it might be a definite instruction that these disability pensions should not be taken into account in assessing relief either through the public assistance committees or other public bodies under the authority of the State.—Sir E. HILTON YOUNG replied: As my hon. and gallant friend is aware, local authorities have recently been reminded that the disability in respect of which the pension has been awarded may be such as to call for a greater measure of assistance than would normally be appropriate. It is essential that in assessing the needs of an applicant for relief regard should be had to all the circumstances of the individual case, and I could not adopt a suggestion which would arbitrarily remove from consideration all income of whatever amount, derived from a particular source.

Erection of Two-room Dwellings.

Mr. SUMMERSBY asked the Minister of Health whether he was aware that in a large number of instances families were living in one room, often a basement, and paying 17*s.* 6*d.* a week rent; and would he consider the desirability of abandoning certain restrictions in order that two-room dwellings might be erected at an economic rent of 5*s.* a week or less, seeing that this would be such an improvement as to justify the abandonment of the present principle of four- or five-roomed houses or none at all.—Sir E. HILTON YOUNG replied: I am not clear what restrictions my hon. friend has in mind but I should be glad to consider any proposals which he may be able to make for reducing the cost of building as he suggests.

Government and Municipal Expenditure.

Mr. JOEL asked the Minister of Health the present policy of the Government with regard to all borough extension, and to municipal outlay in general, apart from the continuance and normal extension of vital services.—Sir E. HILTON YOUNG replied: The policy of the Government with regard to municipal expenditure is set out in the circular issued in September last. With regard to borough extensions, I cannot prohibit a Council from applying to Parliament but I hope that no Council will promote a Bill or a Provisional Order at the present time unless there are very special reasons for doing so. I do not consider that the review of County Districts under the Local Government Act of 1929 should be delayed.

Approved Society Deficiencies.

Mr. DAVID GRENFELL asked the Minister of Health the amount of surplus or deficit, as the case might be, at the last valuation of those societies whose membership was confined to miners.—Sir E. HILTON YOUNG replied: The amount of surplus or deficiency of every approved society will be given in the Appendix to the Report of the Government Actuary on the Third Valuation, which will be published very shortly.

Payment of Income-tax.

Lieut.-Colonel FREMANTLE asked the Chancellor of the Exchequer whether he is now in a position to state what arrangements will be made in the collection of income-tax due on Jan. 1st, to carry out the promise of his predecessor in regard to any cases of hardship arising from the payment of the increased instalment of three-quarters of the tax.—Mr. CHAMBERLAIN replied: My predecessor undertook that consideration would be shown in any case of hardship arising from the payment of the increased instalment of three-quarters. The Board of Inland Revenue are accordingly authorising collectors of taxes in such cases to accept a substantial payment on account in January provided that the taxpayer promises to pay the balance without further application not later than the first week in March. Any taxpayer who is liable to pay an instalment of three-quarters on Jan. 1st but finds it impossible to pay the whole sum on that date can arrange accordingly with his collector of taxes. I must, however, make it clear that this arrangement is to apply only to cases of hardship where the taxpayer cannot find the whole sum immediately. Taxpayers who can meet their liabilities should make a special effort this year to pay their income-tax when it falls due. It is of great importance to the national finances that we should get early payment of income-tax and realise the Budget Estimates for the year and in order that the individual taxpayer should have this brought to his notice I have authorised the Commissioners of Inland Revenue to issue with the income-tax demand notes a copy of the appeal for early payment that was made by my predecessor during the passage of the second Finance Act.

Mr. MAXTON asked the right hon. gentleman what machinery it would be necessary to set up to investigate the cases of hardship in connexion with income-tax.

Mr. CHAMBERLAIN: I do not think it will be necessary to set up any machinery. My experience is that persons who suffer hardship are always quite ready to provide the machinery themselves.

The Sale of Milk.

Sir CHARLES CAYZER asked the Minister of Agriculture whether his attention had been called to the recent publication by the Empire Marketing Board advocating the sale of milk on a basis of quality instead of by volume; and whether this represented the policy of his department.—Sir J. GILMOUR replied: Yes Sir, my attention has been called to Sir William Lampier's report. I am in sympathy with the principle that the price paid for milk should, so far as practicable, be differentiated according to quality, but the matter is one primarily for settlement between the producers and distributors.

MONDAY, NOV. 23RD.

Imports of Foreign Liquid Milk.

Captain HEILGERS asked the Minister of Agriculture if he was aware that a number of empty milk churns were shipped from Harwich to the Continent on or about Nov. 17th with a view to the importation of foreign liquid milk at an early date; and whether he would take any steps to prevent any such importation.—Sir JOHN GILMOUR replied: I have no information with regard to the statement made in the first part of my hon. and gallant friend's question. I am, however, making inquiries. Future action must obviously be governed by future developments.

The Calmette Tuberculosis Vaccine.

Mr. GROVES asked the Minister of Health whether the Medical Research Council had completed their report on the result of their inquiries into the deaths of 76 infants in Lübeck, Germany, following the administration of the Calmette prophylactic tuberculosis vaccine; and, if so, when was it proposed to make the report public.—Sir E. HILTON YOUNG replied: I am sending the hon. Member a copy of a reply given by my predecessor to a question on this subject on Nov. 6th, 1930. As stated in that reply, the report made to the Medical Research Council by their two representatives who visited Germany was a confidential one, and dealt with technical matters which are of interest only to research workers. It is, therefore, not proposed to make the report public. The report did not traverse the ground of the official German inquiry which was made by the Imperial Board of Health. The substance of the report on that inquiry was given in reply to a question on Feb. 17th.[1]

Leprosy in India.

Major MILNER asked the Secretary of State for India the numbers of lepers in India at the latest convenient date; whether he could give figures for the past ten years to show what progress was being made with the disease; and what steps were being taken to combat it.—Sir S. HOARE replied: The number of persons classified as lepers at the census of 1921, the latest official figure available, was 102,513, but it is probable that the number is considerably in excess of that returned. Exact figures to show progress are not available, but great advances have been made through the training of medical men, the survey of infected areas, and the opening of dispensaries. Last year the cases under treatment in the dispensaries of one province alone were more than three times as many as were being cared for in the whole of the leper institutions of India ten years ago.

Highbury Hospital, Birmingham.

Lieut.-Colonel FREMANTLE asked the Minister of Pensions what use would be made of the Highbury Hospital, Birmingham, when it was closed; whether the equipment belonged to the Ministry and, if so, how it would be disposed of; and what was to become of the medical and non-medical staff.—Major TRYON replied: The use to which the premises will be put when the hospital is vacated by the Ministry rests with the trustees. Much of the equipment belongs to the Birmingham Pensions Hospital Committee, but such of it as belongs to the State will be taken over by His Majesty's Office of Works. Alternative employment has been provided or offered to as many as possible of the members of the staff who are in the direct employment of the Ministry, including the medical superintendent. The majority of the staff, however, are employees of the hospital committee.

Lieut.-Colonel FREMANTLE: When such hospitals are about to be closed down, is there any communication with other Government departments which might possibly have a use for them, or is it left to the Office of Works to put the equipment into a warehouse?

Major TRYON: The hospitals as they become vacant for one service are immediately used for another.

Lieut.-Colonel FREMANTLE: I am asking about equipment. Is it left to the Office of Works to keep the equipment in their warehouse, or is it offered to other departments?

Major TRYON: Naturally, the equipment will be used where wanted.

Mr. P. HANNON: Will the right hon. gentleman use his influence to find employment for these officials of the Highbury Hospital who are not officers of the Ministry. Otherwise very great hardship will be inflicted upon them.

Major TRYON: I cannot specially undertake to do that.

Mr. HANNON: Is he aware of the valuable services rendered by these non-official servants?

Major TRYON: I am well aware that their services are valuable, and I have no doubt that the committee will do their best for them.

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[1] See THE LANCET, 1931, i., 446.

TUESDAY, NOV. 24TH.

Employment of Boys in Coal Mines.

Mr. TINKER asked the Secretary for Mines if he would give the latest figures of the number of boys below the age of 16 years who were at present employed and working underground in the coal mines; what number of shifts they had worked during the last 12 months; and how many had been on the night-turn between nine at night and five the following morning.—Mr. ISAAC FOOT replied: In December, 1930, the latest date for which information is avilable, 24,200 boys under 16 years of age were employed below ground at coal mines. I have no information as to the number of shifts worked by such boys, but the average number of shifts worked during 1930 by workers of all ages below ground was approximately 238. No record is kept of the number of boys or other persons employed on night shifts, but a special inquiry undertaken in April, 1927, indicated that at that time nearly one-third of the boys employed worked on shifts ending after 9 P.M. or beginning before 5 A.M.

Miners' Nystagmus in Yorkshire.

Mr. SOPER asked the Secretary for Mines what statistics the department had as to the condition of miners in Yorkshire as regards nystagmus; whether it was increasing or decreasing; and what steps were being taken to reduce it to a minimum.—Mr. ISAAC FOOT replied: Statistics are available for the past few years of the number of cases of nystagmus in Yorkshire report to the certifying surgeons under the Workmen's Compensation Act. These figures show a decrease since 1925 but with some fluctuation. The principal measures in hand for the prevention and cure of nystagmus are those to secure improved lighting in mines and an investigation under the auspices of the Medical Research Council.

Treasury Pensions Account.

Mr. SMEDLEY CROOKE asked the Secretary to the Treasury the total accumulated surplus in hand at the beginning of the present month from the Widows', Orphans', and Old Age Contributory Pensions Act, 1925, and the amount of interest earned by this surplus.—Major ELLIOT replied: It is estimated that after giving effect to the transfer required by Section 3 of the National Economy (National Health Insurance) Order, 1931, the balance to the credit of the Treasury Pensions Account on Oct. 31st, 1931, is rather less than £45,000,000. This sum is not, however, properly to be described as a surplus. It is no more than a balance accumulated in the first years of the scheme which is now diminishing and will be absorbed, together with any accumulations of interest, by the outgoings of the next 10 or 12 years. The interest earned on the investment of this balance is at present at the rate of approximately £2,000,000 a year.

Evasion of Patent Medicine Duty.

Sir ALFRED BEIT asked the Secretary to the Treasury if he was aware that many manufacturers of proprietary medicines were evading the patent medicine duty by ceding their proprietary rights, at the same time retaining the protection and goodwill of their registered trade names; and whether, in view of the loss of revenue caused by this form of evasion, he would take steps to bring this practice to an end.—Major ELLIOT replied: The law provides for exemption from medicine stamp duty in favour of known, admitted and approved remedies, when sold under certain conditions by duly qualified chemists and druggists. I am aware that certain manufacturers have taken steps, one of which is a disclaimer of proprietary rights, to bring their preparations within the scope of the exemption; but provided this is within the terms of the Statute I cannot interfere.

ECONOMY AT ST. THOMAS'S HOSPITAL. — Sir Arthur Stanley, treasurer of St. Thomas's Hospital, has issued a notice directing the attention of the medical and nursing staffs to the necessity for economy. The annual gas bill exceeds £5000; 400,000 units of electricity and 50 million gallons of water are used.

BIRMINGHAM AND MIDLAND SKIN HOSPITAL. — This hospital is appealing for £30,000 to meet the estimated cost of extensions "to enable the hospital to carry on its service to every member of the community." Plans for the minimum extensions fundamental to efficiency include the erection of an in-patient block containing 50 beds, thus increasing the in-patient accommodation by 28 beds, and the adaptation of the present building for use as the out-patient department. There is a waiting list of 71 urgent cases. Last year there were 8434 new out-patients.

MEDICAL NEWS

University of Oxford.

On Nov. 21st the following degrees were conferred:—

D.M.—C. R. Young and J. R. B. Hern.

B.M.—J. F. Brock and W. D. W. Brooks.

University of Cambridge.

On Nov. 20th the following degrees were conferred:—

M.B. & B.Chir.—R. W. McConnel, J. H. Cyriax, and E. S. Stern.

M.B.—J. W. Summerhayes.

Society of Apothecaries of London.

At recent examinations the following candidates were successful:—

Surgery.—S. J. Bellgard, St. Mary's Hosp.; C. J. Blewett, Middlesex Hosp.; J. Britanischski, Univ. of Berlin and London Hosp.; R. N. Gillespie, Royal Free Hosp.; L. B. Reeves, King's Coll. Hosp.; D. N. Ryalls, Univ. of Sheffield; and H. W. Toussaint, St. Mary's Hosp.

Medicine.—R. N. Gillespie, Royal Free Hosp.; G. Handelsman, Univ. of Witwatersrand and London Hosp.; L. B. Reeves, King's Coll. Hosp.; and V. M. White, London Hosp.

Forensic Medicine.—R. Frankling, Guy's Hosp.; R. N. Gillespie, Royal Free Hosp.; G. S. N. Hughes, St. Mary's Hosp.; A. A. Khan, Medical Coll., Calcutta; J. L. King, Charing Cross Hosp.; J. T. Moohalaparackel, Queen's Univ., Belfast; C. E. Nicholson, Charing Cross Hosp.; C. A. Saggoo, King's Coll. Hosp.; F. A. Trowbridge, St. Mary's Hosp.; V. M. White, London Hosp.; and K. G. Wrigley, Univ. of Leeds.

Midwifery.—J. H. Beale, Universities of Oxford and Sheffield; M. Davies, Charing Cross Hosp.; G. S. N. Hughes, St. Mary's Hosp.; and J. W. V. Sheldon, Guy's Hosp.

The following candidates, having completed the Final Examination, are granted the Diploma of the Society entitling them to practise medicine, surgery, and midwifery. S. J. Bellgard, J. Britanischski, G. Handelsman, D. N. Ryalls, J. W. V. Sheldon, H. W. Toussaint, and V. M. White.

University of London.

At a meeting of the Senate on Nov. 18th, the title of professor of bacteriology was conferred on Dr. F. W. Twort, F.R.S., in respect of his post at the Brown Animal Sanatory Institution; the title of professor of clinical anatomy on Dr. H. A. Harris in respect of his posts at University College and University College Hospital Medical School; and the title of professor of psychology on Mr. F. A. P. Aveling in respect of his post at King's College. The title of reader in eugenics was conferred to Miss E. M. Elderton in respect of her post at University College.

The Earl of Athlone has consented to be nominated Chancellor of the University, and other nominations have been withdrawn.

Royal Dental Hospital of London.

The annual dinner of the staff and past and present students of this Hospital was held at the Trocadero Restaurant, London, on Nov. 21st, when there was a large and enthusiastic attendance. Sir Norman Bennett, in proposing from the chair the toast of "The Hospital and School," admitted that, while in one way a rather senior member of the staff, in another way he was the most junior as newly appointed director of the orthodontic department. Although it was in 1901 that the new hospital was built, he was glad still to see so many students of the old school in Leicester-square. It was to them that the new hospital owed its very existence; to benevolent students far more than to the benevolent public. The dental curriculum was, he felt, already too full, and yet there was a growing demand among the public for orthodontic treatment which should not be left to the specialist, but should be undertaken (in spite of the text-books) by the dental practitioner. He recalled the crisis of 1921 when dentistry became a professional monopoly, and emphasised the duty of living up to this position. The 1921 dentists must be replaced as they dropped out, and at the present moment the entries were not equal to the wastage. Responding to the toast, Mr. Harry Stobie, Dean and Director of Studies at the Hospital and School, said that students who used their eyes and brains during their study years had no need to return at once after qualifying for six months' post-graduate study. He mentioned the rearrangement in the teaching staff of the school consequent on the abandonment of the teaching of chemistry and physics as pre-medical subjects. He welcomed the outcome of long continued negotiation with the University of London by which the degree curriculum in dentistry had been so modified that if a student was obliged from time or economy to drop out he could still carry on with his diploma course. The number of students had reached its bottom limit last year, and the school was now again increasing in numbers. Mr. N. J. Ainsworth proposed "The Visitors," and Prof. T. B. Johnston, Dean of Guy's Hospital Medical School, responded. Speaking

of the friendly relations between the two schools, he expressed frank admiration for the department of dental histology at the Royal Hospital. Mr. W. H. Dolamore proposed "The Chairman." Among the visitors were the Deans of the London Hospital and of the London (R.F.H.) School of Medicine for Women. During the evening Mr. Sterndale Bennett entertained.

Dr. Alfred Cox Testimonial Fund.

A meeting of the Executive Committee of this Fund was held on Wednesday, Nov. 11th, when it was stated that the presentation of the portrait would be made during the centenary meeting of the Association, and that all subscribers—who up to the present moment number about 1500,—would receive invitations. It was decided that a presentation book, recording the names of the subscribers, should be prepared for acceptance with the portrait by Dr. Cox. The Committee repeated their desire that as many members as possible of the B.M.A. should contribute to the fund, sending any sum they might choose, not exceeding 10s. All subscriptions should be addressed to Mr. N. Bishop Harman, at the B.M.A. House, Tavistock-square, London, W.C. Dr. E. Rowland Fothergill is acting as Hon. Secretary.

Harveian Society of London.

The Buckston Browne prize and medals have been awarded to Mr. Cecil P. G. Wakeley and Mr. Laurence O'Shaughnessy, whose essays on the Treatment of Shock by Intravenous Therapy were deemed by the president and assessors to be of equal merit.

No. 14 Stationary Hospital, B.E.F.

The twelfth annual dinner of the medical officers of this hospital will be held at the Trocadero Restaurant, Piccadilly, on Friday, Dec. 11th. Colonel C. R. Evans will be in the chair. Members of the mess who wish to attend, and who have not received a notice, should apply to the secretaries, Lieut.-Colonel H. M. Perry and Dr. H. L. Tidy, 39, Devonshire-place, London W.1.

International Congress on Biliary Lithiasis.

This congress will be held at Vichy from Sept. 19th to 22nd, 1932, under the chairmanship of Prof. Carnot. It will be divided into sections of medicine, surgery, therapeutics and hydrology, and electro-radiology and physical therapy. Those wishing to take part are asked to notify the general secretariat of the congress at 24 Boulevard des Capucines, Paris.

Royal Surgical Aid Society.

The sixty-ninth annual meeting of this society will be held at the Mansion House, London, on Tuesday, Dec. 1st, at 4 P.M., with the Lord Mayor in the chair. Among the speakers will be Sir James Dundas-Grant. The offices of the society are in Salisbury-square, Fleet-street, E.C. 4.

Hunterian Society.

A meeting of this society was held at the Apothecaries' Hall, London, on Monday, Nov. 16th, by permission of the Master, when Dr. David Ross presided over a large number of members and their friends, the Great Hall of the Apothecaries Society being crowded. The subject for discussion, the Medical Aspects of Crime in Fact and Fiction, was introduced to the company by three speakers, Dr. Norwood East, Dr. Edwin Smith, and Mr. C. J. S. Thompson, who, in approaching the subject from different angles, provided much statistical information on the occurrence of crime, the possibilities of undetected poisoning, and the precautions against premature burial. Among the speakers joining in the discussion were Mr. Ivor Back, Sir Squire Sprigge, Sir James Dundas-Grant, Mr. Mortimer Woolf, and Dr. Campbell MacClure. The evening terminated with an informal reception.

Liverpool Medical Institution.

At a special general meeting of this institution on Nov. 19th, honorary membership was conferred on Lord Dawson, Emeritus Prof. Archibald Donald, and Sir Robert Jones. At the annual dinner, held at the Adelphi Hotel on the same evening, Lord Dawson said that there was no place like a medical society for giving the truth a free road and falsehood the go-by. Prof. W. Blair Bell, the President, described the institution as one of the greatest post-graduate schools in the country, with an average weekly attendance of over 70 members. This year, he said, the final-year students had been invited to attend the meetings, to hear their teachers taught, and the invitation had been much appreciated. Prof. W. Fletcher Shaw proposed the toast of "The City and University of Liverpool," and the Lord Mayor and Vice-Chancellor Hetherington responded. Sir Robert Jones and Prof. R. W. Johnstone replied to the toasts of "The Guests," proposed by Prof. R. E. Kelly.

College of Medicine, Newcastle-upon-Tyne.

A series of lectures on Recent Advances in Physiology Applicable to Medicine is being arranged by the University of Durham College of Medicine at Newcastle-upon-Tyne. The first, entitled Some Investigations in Relation to Medicine will be given at the College on Friday, Dec. 4th, at 4.0 P.M., by Prof. Edward Mellanby, F.R.S. Medical practitioners are invited to attend.

Golden-square Throat, Nose and Ear Hospital.

This hospital, which is near Piccadilly Circus, London, has recently opened two contributory wards, one for men and one for women. They are divided into cubicles, and the charge for admission is four guineas a week, inclusive.

Salaries in Mental Hospitals.

After consultation with representatives of those interested the Mental Hospitals Association recommend the following temporary deductions (not to affect pensions) from the salaries of employees in mental hospitals: from the first £200, 2½ per cent.; from the next £100, 3¾ per cent.; from the next £250, 5 per cent.; from the next £250, 7½ per cent.; from the remainder, 10 per cent.

Port Sunlight Hospital.

When an extension of this hospital was opened last week Lord Leverhulme claimed that it is unique as possessing all the accommodation that it requires. The extension, which forms a new wing, in addition to being equipped with a spacious waiting-room and dressing-rooms for out-patients, medical examination rooms, and a massage room, will provide accommodation for the Sunlight Sick Club, which has hitherto been housed elsewhere. Last year 433 patients were admitted.

Seaham Hall Sanatorium.

This sanatorium of the Durham County Council is about to be enlarged at a cost of £30,000. Seaham Hall, which was formerly one of Lord Londonderry's residences, was given by him four years ago as a tuberculosis sanatorium for women and children. The extension will add 52 beds to the existing 80, and there will be a new theatre. In addition to a number of single-bed wards for special cases, there is to be a 20-bed ward for adults and a 26-bed children's ward, with the necessary staff accommodation.

British Institute of Radiology.

The annual congress of this institute, which is incorporated with the Rontgen Society, will be held at the Central Hall, Westminster, from Dec. 2nd to the 4th, under the presidency of Dr. A. E. Barclay. Lord Rutherford will open the congress at 2.30 P.M. on Wednesday, and at 5 P.M. on the same day Sir James Jeans will deliver the Silvanus Thompson lecture, entitled What is Radiation? The Mackenzie Davidson lecture will be given at 5 P.M. on Thursday by Prof. Hans Holfelder, whose subject is the Comparison of Medical, Surgical, and Radiological Conceptions in Relation to the Treatment of Disease. Dr. Barclay will deliver his presidential address at 5 P.M. on Friday. Further particulars of the meetings will be found in our Medical Diary. An exhibition of apparatus, organised by the associated manufacturers, will be in progress at the Central Hall from 10 A.M. onwards each day. The annual dinner will be held at the Trocadero Restaurant, London, on Friday at 7.30 P.M.

Bruxelles-Médical Cruise.

The medical cruise organised annually by the Bruxelles-Médical has been arranged for 1932 to take place during the last week in July and the first three weeks of August. The *Brazza*, a well-appointed ship, with a displacement of 15,000 tons and oil-driven, has been chartered, and the time-table indicates that the vessel leaving Bordeaux on July 26th will call at a succession of ports—namely, Porto, Lisbon, Punta Delgada, Horta, Funchal, Teneriffe, Casablanca, Tangier, Ceuta, Palma, Cagliari, and Leghorn—finally reaching Marseilles on August 21st. No passengers other than doctors and their families are invited to take part in the cruise. A number of optional excursions have been organised in connexion with the cruise, the cost of which is 4975 French francs first class, and 2325 French francs second class. Further particulars can be obtained from Section des Voyages de Bruxelles-Médical, 29, Boulevard Adolphe Max, Brussels.

Appointments

Cardiff Royal Infirmary: TENISON COLLINS, B. K., M.D., B.C. Camb., F.R.C.S.E., and STRACHAN, G. I., M.D., Ch.B. Glasg., F.R.C.P. Lond., F.R.C.S. Eng. and Edin., Honorary Gynæcologists.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Dec. 1st.—8.30 P.M., PATHOLOGY. Laboratory Meeting at the Lister Institute of Preventive Medicine, Chelsea Bridge-road, S.W. (Sloane-square Station). Demonstrations: E. W. Hurst: Lesions Due to Louping-ill Virus in Mouse and Monkey. J. Czarkowska-Gladney: Symptomatology of Louping-ill in Mouse. M. Robertson: Some Biological Reactions with Irradiated and Non-irradiated Bodo Caudatus. H. L. Schütze: Envelope Development in *B. pestis*. R. Robinson and A. H. Rosenheim: Experiments on Calcification of Bone. J. C. G. Ledingham: Agglutination of Elementary Bodies. Short Communications: H. L. Schütze: Active Immunisation against *B. pestis*. R. Robinson: The Duality of the Mechanism of Bone Calcification. G. F. Petrie and W. T. J. Morgan: The Curative Action of Antipneumococcus Serum (Type 1) in Mice. G. H. Eagles: Growth of Vaccinia Virus in Cell-free Fluid (New Series). 8.30 P.M., ORTHOPÆDICS. Papers: Mr. Paul Bernard Roth: The Effect of Wearing High Heels. Mr. Watson Jones: Pathological Dislocations of the Atlas and their Treatment. Cinematograph demonstrations: Mr. R. C. Elmslie: Arthroplasty of Elbow-joint. Dr. Redvers Ironside: Cerebral Diplegia—Its Classification and Prognosis.

WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. Paper: Mr. G. Buckston Browne: Sixty Years of Surgical Retrospect. Discussion: Sir John Thomson-Walker and others. Exhibit: Dr. J. D. Rolleston: A Flagon from Sir Benjamin Ward Richardson's Wine Cellar. 8.30 P.M., NEUROLOGY AND SURGERY. Special Discussion on the Diagnosis and Treatment of Acute Head Injuries. Openers: Dr. George Riddoch, Mr. Geoffrey Jefferson, Dr. W. Ritchie Russell, and Mr. J. Paterson Ross. Other speakers will take part.

THURSDAY.—8 P.M., TROPICAL DISEASES AND PARASITOLOGY; THERAPEUTICS AND PHARMACOLOGY. Special Discussion on the Actions and Uses of Antimony Compounds. Openers: Dr. J. B. Christopherson and Sir Aldo Castellani (Tropical Diseases); Dr. J. W. Trevan and Sir William Willcox (Therapeutics). Other speakers will take part. 8.30 P.M., RADIOLOGY. Slides of a few interesting cases will be shown by Dr. R. M. Beath, Dr. J. M. Brailsford, Dr. R. D. Paterson, Dr. Duncan White, and Dr. H. Graham-Hodgson.

FRIDAY.—10.30 A.M., OTOLOGY. (Cases at 9.30 A.M.) Papers: Dr. T. B. Jobson: Cholesteatoma with Aural Suppuration: Its Relation to Prognosis. Dr. J. A. Gardner: Cholesterin Metabolism and Cholesterohæmia. Mr. Sydney Scott: Ménière's Disease. Mr. Thacker Neville: Ménière's Disease. Cases and specimens will be shown. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.). Discussion: The Treatment of Malignant Disease of the Hypopharynx. Openers: Prof. von Eicken (Berlin), Mr. Wilfred Trotter, and Mr. J. B. Hunter. Cases and specimens will be shown. 8.30 P.M., ANÆSTHETICS. Paper: Sir Francis Shipway: Resuscitation During Anæsthesia and of the Newly-born.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

FRIDAY, Dec. 4th.—7.15 for 7.30 P.M., Dinner meeting at Hotel Rembrandt, Brompton-road. Discussion starts 8.15 P.M. Subjects: Normal Development in the Infant and the Young Child. Openers: Dr. Sidney Owen, Prof. H. A. Harris, Dr. Vaughan Pendred.

BRITISH INSTITUTE OF RADIOLOGY.

WEDNESDAY, Dec. 2nd.—2.30 P.M., Opening of annual congress at Central Hall, Westminster by Lord Rutherford.—3.30 P.M., Prof. Haenisch: Experiments on Inflammability of Films.—5 P.M., Sir James Jeans: What is Radiation? (Silvanus Thompson lecture.)

THURSDAY.—10 A.M., Technical Papers.—3 P.M., Dr. R. G. Canti: Effects of Radium on Living Tissues Cultivated in Vitro.—5 P.M., Prof. Hans Holfelder: Comparison of Medical, Surgical, and Radiological Conceptions in Relation to Disease. (Mackenzie Davidson lecture.)

FRIDAY.—10 A.M., Discussion on Radiation Treatment of Leukæmia. Opener: Sir Thomas Horder.—11.30 A.M., Discussion on Lipiodol in Diagnosis of Intrathoracic Disease. Opener: Dr. L. S. T. Burrell.—5 P.M., Dr. A. E. Barclay: Presidential address.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Nov. 30th to SATURDAY, Dec. 5th.—INFANTS HOSPITAL, Vincent-square, S.W. Special post-graduate course in Diseases of Infants, occupying each afternoon from 2 to 5 P.M., with demonstrations and lectures. Special visits arranged for Sat. and Sun.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars, S.E. Afternoon course in Dermatology, clinical instruction daily from 2.30 P.M.—LONDON LOCK HOSPITAL, Dean-street, W. Post-graduate Course in Venereal Disease. Every afternoon.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square. Free lecture on Wed., Dec. 2nd at 4.0 P.M., by Mr. A. Tudor Edwards on Surgical Chest Diseases.—CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS, Victoria Park, E. Free demonstration by Mr. W. H. C. Romanis at 9.15 A.M. on Tues.—NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W. Free post-graduate demonstration in the Out-patient Department, by Mr. F. W. Price on Thurs. at 3.0 P.M. Further particulars from the Fellowship of Medicine.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Nov. 30th.—10 A.M., Gynæcological Wards; Genito-urinary Operations; Skin Department. 11 A.M., Surgical Wards. 2 P.M., Surgical Wards; Medical, Surgical, Eye, and Gynæcological Out-patients.

TUESDAY.—9.30 A.M., Operations. 10 A.M., Medical Ward Demonstration; Dental Department. 11 A.M., Throat Operations. 11.30 A.M., Surgical Demonstration. 2 P.M., Operations; Medical, Surgical, and Throat Out-patients.

WEDNESDAY.—10 A.M., Medical Wards; Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients. 2.30 P.M., Gynæcological Operations. 4.45 P.M., Venereal Diseases Demonstration.

THURSDAY.—10 A.M., Neurological Department. 11.30 A.M., Fracture Demonstration. 2 P.M., Medical, Surgical, Eye, and Genito-urinary Out-patients. 2.30 P.M., Operations.

FRIDAY.—10 A.M., Medical Wards, Skin Department, Dental Department. 2 P.M., Medical, Surgical, and Throat Out-patients. 2.30 P.M., Operations.

SATURDAY.—9 A.M., Throat Operations. 10 A.M., Medical Wards. Surgical Out-patients: Children's Medical Out-patients.

ST. MARK'S HOSPITAL, City-road, E.C.

THURSDAY, Dec. 3rd.—4.30 P.M., Mr. P. Lockhart-Mummery: Fistula in Ano.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Dec. 1st.—3.15 P.M., Mr. C. S. Lane-Roberts: Some Important Decisions in the First Stage of Labour.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham, S.W.

WEDNESDAY, Dec. 2nd.—4 P.M., Mr. V. Zachary Cope: Demonstration of Surgical Cases.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.

WEDNESDAY, Dec. 2nd.—4 P.M., Mr. Arthur Gray: Contraception.

ST. PAUL'S HOSPITAL, Endell-street, W.C.

WEDNESDAY, Dec. 2nd.—4.30 P.M., Mr. Frank Kidd: Urethroscopy.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Dec. 4th.—4 P.M., Mr. H. Kisch: Frontal Sinusitis—Diagnosis and Treatment.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.

THURSDAY, Dec. 3rd.—9 P.M., Mr. C. P. G. Wakeley: Hernia—Its Complications and Treatment.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Dec. 1st.—5 P.M., Dr. A. C. Roxburgh: Cutaneous Syphilis (1).

THURSDAY.—5 P.M., Dr. Roxburgh: Cutaneous Syphilis (2).

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Dec. 2nd.—4 P.M., Prof. H. R. Kenwood: Health Education of the Citizen.

CHADWICK PUBLIC LECTURE.

THURSDAY, Dec. 3rd.—8.15 P.M. (in the Institution of Mechanical Engineers, Storey's Gates, Westminster), Mr. J. D. Watson: The Need for More Effective Treatment of Sewage Sludge.

MANCHESTER ROYAL INFIRMARY.

TUESDAY, Dec. 1st.—4.15 P.M., Dr. E. W. Twining: Radiology of Non-tubercular Chest Lesions.

FRIDAY.—4.15 P.M., Dr. J. Wharton: Demonstration of Ophthalmic Cases.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL, Elizabeth-street.

WEDNESDAY, Dec. 2nd.—4.30 P.M., Dr. S. Kelly: The Investigation and Treatment of Gall-bladder Disease.

MANCHESTER HOSPITAL FOR CONSUMPTION, Hardman-street, Deansgate.

WEDNESDAY, Dec. 2nd.—4.30 P.M., Mr. V. F. Lambert: Running Ears.

UNIVERSITY OF SHEFFIELD.

FRIDAY, Dec. 4th.—3.30 P.M. (at the Royal Infirmary), Mr. W. J. W. Ferguson: Some Common Eye Diseases.

EAR, NOSE, AND THROAT HOSPITAL, Glasgow.

WEDNESDAY, Dec. 2nd.—4.15 P.M., Ear, Nose, and Throat Cases.

THE FACULTY HALL, St. Vincent-street, Glasgow.

TUESDAY, Dec. 1st.—4 P.M., Prof. G. B. Fleming: Birth Injuries.

ANCOATS HOSPITAL, Manchester.

THURSDAY, Dec. 3rd.—11 A.M., Dr. W. J. S. Reid: Clinical Demonstration. 4.15 P.M., Mr. F. H. Diggle: Foreign Bodies in Food Passages—Their Symptoms and Relative Urgency.

NOTES, COMMENTS, AND ABSTRACTS

INDIVIDUAL PSYCHOLOGY AND PSYCHO-ANALYSIS.

ADDRESSING the Medical Society of Individual Psychology in London on Nov. 19th, Dr. Erwin Wexburg, of Vienna, said that individual psychology is based on one principle or "final tendency"—namely, the purposive unity of man's personality. In psycho-analysis on the other hand, though a great deal is said concerning final methods of interpretation, the theory as a whole is causal. Individual psychology agrees that causality operates, but it points out that this perception does not help towards the understanding of a man's personality. For this purpose the person must be regarded as a whole, as a purposive unity built up on childish patterns. Psycho-analysis, he continued, does not agree with this point of view. It acknowledges that childhood patterns are maintained throughout a whole life, but it explains this by an energetic simile: if libido is checked it will flow back to childhood indulgences. But this theory clears up nothing but itself. The energetic calculation is right, but psychical energy, the libido, is only a working hypothesis, a natural power like electricity or warmth, it is not a fact. But a real fact, the subject, is missing here as it is in the whole of psycho-analytical theory. This is a mistake. A psycho-analyst cannot even make a purchase or call upon a friend without acknowledging what he is denying in theory, that there is a centre of personal life, whose purposes are to be understood by motives, and not to be explained by energetic calculations.

The same profound difference between theory and practice is to be found in psycho-analytical therapy. After daily interviews for years suppressed tendencies are brought to light, and are then mastered by the ego, the representative of reality. But who does this? Does the libido regulate itself? This must be so if the work is done by the ego instincts, since psycho-analysts maintain that the ego instincts are nothing but a certain form of libido. To the individual psychologists, however, the ego is the central personality, responsible for itself, and for its rôle in social life. The neurotic differs from the healthy man in that, unknown to himself, he seeks for ends not adapted to reality. By treatment he gains insight into where he was wrong, and so is enabled to change his method of life. This is what psycho-analysis calls sublimation and transference of libido on to legitimate objects.

Dr. Wexburg pointed out that Freud's original method of psychical research is fully adapted to the idea of finalism, which is the basis of individual psychological theory and practice. The individual psychologist considers that tendencies which betray themselves by dreams of neurotic symptoms are characteristic of the subject's style of life, of his "personal purposive pattern." For the psycho-analyst they are strivings of his sexual desires. Again, he said, the subject is missing.

"THAT REMINDS ME OF A STORY."

A LITTLE book entitled "Jokes: Seen and Unseen,"[1] forms reminiscences, through the compiler's lifetime, of stories which have appeared to him worth bringing together in a convenient form. Though the author disclaims intention to classify them, they are divided into stories relating to principals and other high dignitaries; to professors and lecturers, to students, and to characteristics or episodes related to various university circles that have gone the round in their particular centres. While some of the stories are certain to be familiar to many readers, there are others which will probably be new, The risk that any story selected for quotation, though new to the reviewer, might not be so to readers, prevents the reproduction of any excerpts, but the little volume is an obvious contradiction to a popular estimate of the Scottish character, in that some of the best jokes emanate from northern universities. Many of these anecdotes will probably be new in larger circles than those where they are perennially popular.

[1] Jokes: Seen and Unseen. By David Fraser-Harris, B.Sc. Lond., M.D. Glasg., D.Sc. Birm., sometime Professor of Physiology, Dalhousie University. Paisley: Alexander Gardner, Ltd. 1931. Pp. 126. 2s.

NEW PREPARATIONS.

NOVUTOX.—This preparation, a new local anæsthetic, is described by the manufacturers (The Pharmaceutical Corporation, Ltd., 39, Aldersgate-street, E.C.) as self-sterilising and possessing a powerful chemo-therapeutical action upon wounds. The chemical composition is para-amino-benzoyldiethylaminoethanol hydrochloride and adrenalin in Ringer's solution with an addition of quinotoxins in proportion of 1 : 80,000 and 0·1 to 0·2 per cent. benzoic acid. The solution is isotonic. The bacteriological results furnished to the manufacturers by their experts point to a highly valuable quality in the preparation. Novutox is supplied in ampoules and in 2 oz. bottles, in each case the percentage strength of the solution being indicated on the receptacles, and a statement of the manufacturers as to the advantages claimed is also enclosed. These may be summarised as follows. In addition to the self-sterilising property already mentioned, the anæsthetic is described as prompt, deep, and lasting, there is an absence of distressing systemic effects, the toxicity is low, and the healing process rapid. In support of these claims the Pharmaceutical Corporation, Ltd., has forwarded to us a large number of signed statements from responsible persons, including a well-known professor of surgery written from the hospital where his Chair is located; the author of a scientific manual of bacteriology, who writes from the hospital where his tests were made; and many members of the medical staffs of general and special hospitals, especially dental practitioners. The evidence which has thus been brought to our attention is particularly strong, so that we feel safe in commending the trial of Novutox to our readers. At the same time we may remind Pharmaceutical Corporation, Ltd., of the valuable support to their contentions that would be obtained by a verdict from the Therapeutic Trials Committee of the Medical Research Council, a body which is prepared to consider applications by commercial firms for the examination of new products. These have to be submitted, with the available experimental evidence of their value, when appropriate clinical trials can be arranged in suitable cases.

The same firm send us a bactericidal sterilising fluid termed ASAPA to be used for surgical instruments, injection syringes, and dental instruments. They supply here also signed evidence that the preparation does not rust, stain, or corrode instruments, nor impair cutting edges. The fluid which is employed undiluted is supplied in approximately one quart bottles on which full directions for use are affixed. These directions contain the important caution that in order to eliminate every risk to the patient it is absolutely essential to remove every trace of Asapa from syringes after they have been sterilised. This can be done by rinsing with Ringer's or physiological saline solution. The warning is also given that no Asapa must come into contact with the local anæsthetic.

THE CÆSAREAN OPERATION.

A PAPER on Cæsarean Section, its History and Present Status, was read by Dr. A. H. Davidson, president-elect of the Dublin University Biological Association, at the annual opening meeting of the Society. Tracing its history from early times, he pointed out that it was attended by a very large mortality during the eighteenth and nineteenth

centuries, and was used only as a last resort. For some time it lost favour, but later regained popularity amongst obstetricians. Its rehabilitation was greatly assisted by the attitude of the Roman Catholic Church. The operation really began to have a definite place in obstetrics from the year 1880 onwards, and figures collected in 1911 and 1921 showed that it was gradually becoming safer. This was leading to a swing of the pendulum in the opposite direction, and the present tendency, especially in America and on the continent, was to perform the Cæsarean section rather too often. Dublin had adopted an attitude of extreme conservatism towards it, using it only when necessary in the interests of mother and child. Dr. Davidson then showed a cinematograph film of a lower segment Cæsarean section performed at Dr. Steevens' Hospital some weeks previously.

Dr. Bethel Solomons reported 161 Cæsarean operations performed in the Rotunda Hospital during the first four years of his Mastership. Of these 85 were done by the lower segment route with one death, and this case was complicated by the presence of tumours.

SOCIETY FOR CULTURAL RELATIONS WITH RUSSIA.

A MEETING of this Society, open to members and their friends, was held on Monday last, Nov. 23rd, at the London School of Hygiene and Tropical Medicine. The chair was taken by Sir Squire Sprigge, who pointed out the strictly non-political aspect of the Society's work, when introducing to the meeting Dr. C. Ellingworth, Dr. E. Mapother, and Dr. Hilda Stoessiger, who gave short accounts of their recent tour of observation in Russia. The three speakers reported on various aspects of health preservation and medical organisation under the Five Years Plan in a kind but critical manner, and replied fully to a varied assortment of questions.

ELECTRIC PIANOS.

ACCORDING to the daily press the police in Barcelona have arrested the organiser of the lottery in which a number of English medical men drew the second prize (THE LANCET, Oct. 31st, p. 996 and Nov. 14th, p. 1112). His swindle is said to have met with some success, and follows a similar attempt to deceive Spanish doctors a year ago.

Vacancies

For further information refer to the Advertisement columns.

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.

Argyll and Bute Mental Hospital, Lochgilphead.—Jun. Asst. M.O. £300.

Bethnal Green Hospital, Cambridge-road, E.—Res. Med. Supt. £1100.

Birmingham, Little Bromwich Isolation Hospital.—Med. Supt. £1100.

Bolton Infirmary and Dispensary.—Asst. Res. M.O. £200.

Bradford, Royal Eye and Ear hospital.—Jun. H.S. £150.

Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.

Brighton, Sussex Eye Hospital.—Hon. Clin. Asst.

British Institute of Radiology, Welbeck-street, W.—Sub-Editor. £400–£500.

Burnley, Victoria Hospital.—Two H.S.'s. Each at rate of £150.

Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist and Emergency O. £130.

Cardiff, King Edward VII. Welsh National Memorial Assn. Area.—Asst. Tuber. Physician. £500.

Cardiff Royal Infirmary.—Hon. Asst. Physician, Hon. Asst. Gynæcologist, Hon. Dental Surgeon.

Charing Cross Hospital, W.C.—Res. Cas. O. £200.

Connaught Hospital, Walthamstow, E.—Res. Cas. O. At rate of £100.

Coventry and Warwickshire Hospital.—Res. House and Asst. H.S.'s. Each £125.

Croydon General Hospital.—Res. M.O. £200.

Doncaster Royal Infirmary.—H.S. At rate of £175.

Dreadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110.

East Ham Memorial Hospital, Shrewsbury-road, E.—Phys. to Skin Dept.

East London Hospital for Children, Shadwell, E.—Res. Cas. O. At rate of £125.

Edinburgh Royal College of Physicians.—Kirk Duncanson Fellowship for Medical Research. £150.

General Lying-in Hospital, York-road, Lambeth, S.E.—Jun. Res. M.O. and Anæsthetist. At rate of £100.

Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—H.S. Also Cas. M.O. Each at rate of £100.

Hospital for Tropical Diseases, Endsleigh-gardens, W.C.1.—Surg.

Huddersfield Royal Infirmary.—Two H.S.'s. Each at rate of £150.

Jersey General Hospital and Poor-law Infirmary.—Res. M.O. £200.

Khartoum, Wellcome Tropical Research Laboratories.—Bacteriologist. £E.660.

King Edward Memorial Hospital, Ealing.—Hon. Dental Surgeon.

Leicester, City Mental Hospital, Humberstone.—Jun. Asst. Res. M.O. £350.

Lewisham Hospital, High-street, Lewisham, S.E.—H.P. At rate of £80.

Liverpool and Samaritan Hospital for Women.—Hon. Asst. Surg.

Liverpool University and Maternity Hospital.—Obstetric Asst. £500.

L.C.C.—Consulting Laryngologists. Each 200 gns.

London Jewish Hospital, Stepney Green, E.—Hon. Asst. Gynæcologist.

London University.—Geoffrey Duveen Travelling Studentship in Oto-Rhino-Laryngology. £450.

Manchester, Ancoats Hospital.—Part-time Asst. for Pathological Dept. At rate of £200. Also Clin. Asst. for Out-patient Clinic. 10s. 6d. per attendance.

Manchester Royal Infirmary.—Asst. Res. S.O. At rate of £150. Also Res. M.O. £200.

Miller General Hospital, Greenwich-road, S.E.—H.P. and two H.S.'s. Each at rate of £125.

National Hospital, Queen-square, W.C.—Hon. Asst. Radiologist.

Newark General Hospital.—Res. H.S. £175.

Newcastle General Hospital.—Part-time Med. Reg. and Surg. Reg. Each at rate of £250.

Newcastle-upon-Tyne, Royal Victoria Infirmary (North of England Radium Institute).—Radium Officer. £800.

Plymouth Central Hospital.—Res. H.S. At rate of £150.

Prince of Wales's General Hospital, N.—Hon. Clin. Assts. to Special Depts.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, North Kensington, W.—H.S. At rate of £100.

Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100.

Reading, Royal Berkshire Hospital.—H.S. and H.P. Each at rate of £150.

Rochester, St. Bartholomew's Hospital.—Res. Surg. O. At rate of £225.

Rotherham Hospital.—H.P. £180.

Royal Free Hospital, Gray's Inn-road, W.C.—Surg. Reg. £200. Res. Cas. O. £150. District Obstetric Asst. £100. Med. Reg. and Gynæcological Reg. Each at rate of £100. Also H.P.'s and H.S.'s to Special Depts.

Royal London Ophthalmic Hospital, City-road, E.C.—Out-patient Officer. £100.

Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Med. Registrar. £150.

St. Mark's Hospital for Cancer, Fistula and Other Diseases of the Rectum, City-road, E.C.—Hon. Asst. Surgeon.

Salford Royal Hospital.—H.P. £125.

Wakefield, West Riding Mental Hospital.—Jun. Asst. M.O. £400.

Warwick, King Edward VII. Memorial Sanatorium, Hartford-hill. Jun. M.O. At rate of £200.

West London Hospital, Hammersmith-road, W.—H.P. and H.S. to Special Depts. Each at rate of £100.

Westminster Hospital, Broad Sanctuary, S.W.—H.S. At rate of £102.

Windsor, King Edward VII. Hospital.—Two H.S.'s. Each at rate of £100.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons: Portmadoc (Caernarvon), Ballater (Aberdeen), and Tobermory (Argyll).

Births, Marriages, and Deaths

BIRTHS.

BRADBURY.—On Nov. 22nd at Roydale, Penwortham, Preston, to Dr. and Mrs. F. C. S. Bradbury—a daughter.

CARR.—On Nov. 16th, the wife of T. E. Ashdown Carr, M.B., B.S., of Charnwood-street, Derby, of a daughter.

CONNELLAN.—On Nov. 18th, 1931, to Mr. and Mrs. Percival Connellan, of "Marmion," Shortheath, Farnham, Surrey—a son.

GILDING.—On Nov. 17th, at Oakwood-road, N.W., the wife of Dr. H. P. Gilding, of a daughter.

POWELL.—On Nov. 19th, the wife of H. J. Powell, L.D.S. R.C.S. Eng., Putney, of a daughter.

DEATHS.

CARTER.—On Nov. 21st, at Driffold, Sutton Coldfield, Thomas Carter, M.R.C.S., L.R.C.P., late of Richmond, Yorkshire, aged 90.

COLLIER.—On Nov. 17th, at Carlisle-road, Hove, John T. Collier, M.D., late of Lincoln.

COLLINGWOOD.—On Nov. 23rd, at a London nursing home, Frederick William Collingwood, L.R.C.P. Lond., M.R.C.S. Surgeon, R.N. (retired), aged 69 years.

IRONSIDE.—On Nov. 24th, 1931, Charles Andrew Ironside, M.A., M.B., C.M., of 8, Highbury New Park, London, aged 73 years.

MACLELLAN.—On Nov. 20th, William MacLellan, M.R.C.S. Eng., of "Bath House," Bath-road, Worthing (late of Dartmouth-road, N.W.), aged 75.

PENDLEBURY.—On Nov. 18th, in London, John Philip Pendlebury, M.R.C.S., L.R.C.P., aged 67.

WEAR.—On Nov. 22nd, at Wentworth-place, Newcastle-on-Tyne, Arthur Taylor Wear, M.D., V.D., in his 80th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.